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PROVISIONAL

DRILL REGULATIONS FOR FIELD ARTILLERY

(4.7-INCH GUN)

UNITED STATES ARMY

1917

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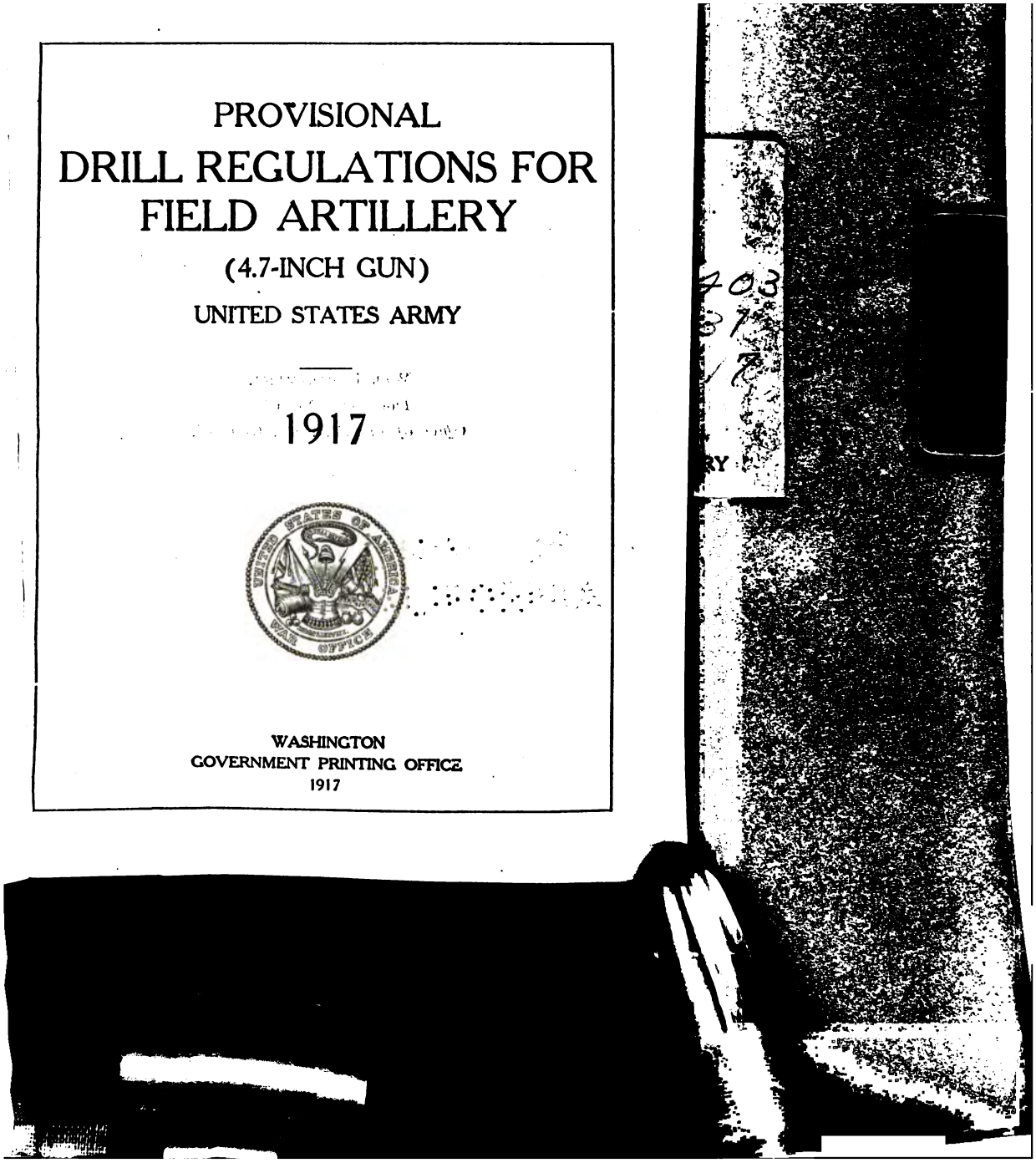
PROVISIONAL
DRILL REGULATIONS FOR FIELD ARTILLERY
(4.7-INCH GUN)
UNITED STATES ARMY

1917

WASHINGTON
GOVERNMENT PRINTING OFFICE
1917



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1917

FIELD ARTILLERY

War Department.
Document No. 652.
Office of The Adjutant General.

652

WAR DEPARTMENT,
WASHINGTON, *August 28, 1917.*

The following system of Provisional Drill Regulations for Field Artillery (4.7-inch gun), 1917, is approved and herewith published for the information and guidance of the Army of the United States.

These regulations are to be used in connection with Provisional Drill and Service Regulations for Field Artillery (Horse and Light), 1916, and only the paragraphs that differ from the paragraphs in those regulations are published herein.

[334.2, A. G. O.]

BY ORDER OF THE SECRETARY OF WAR:

H. L. SCOTT,
Major General, Chief of Staff.

OFFICIAL:
H. P. McCAIN,
The Adjutant General.

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RY

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PART II.

DISMOUNTED INSTRUCTION.

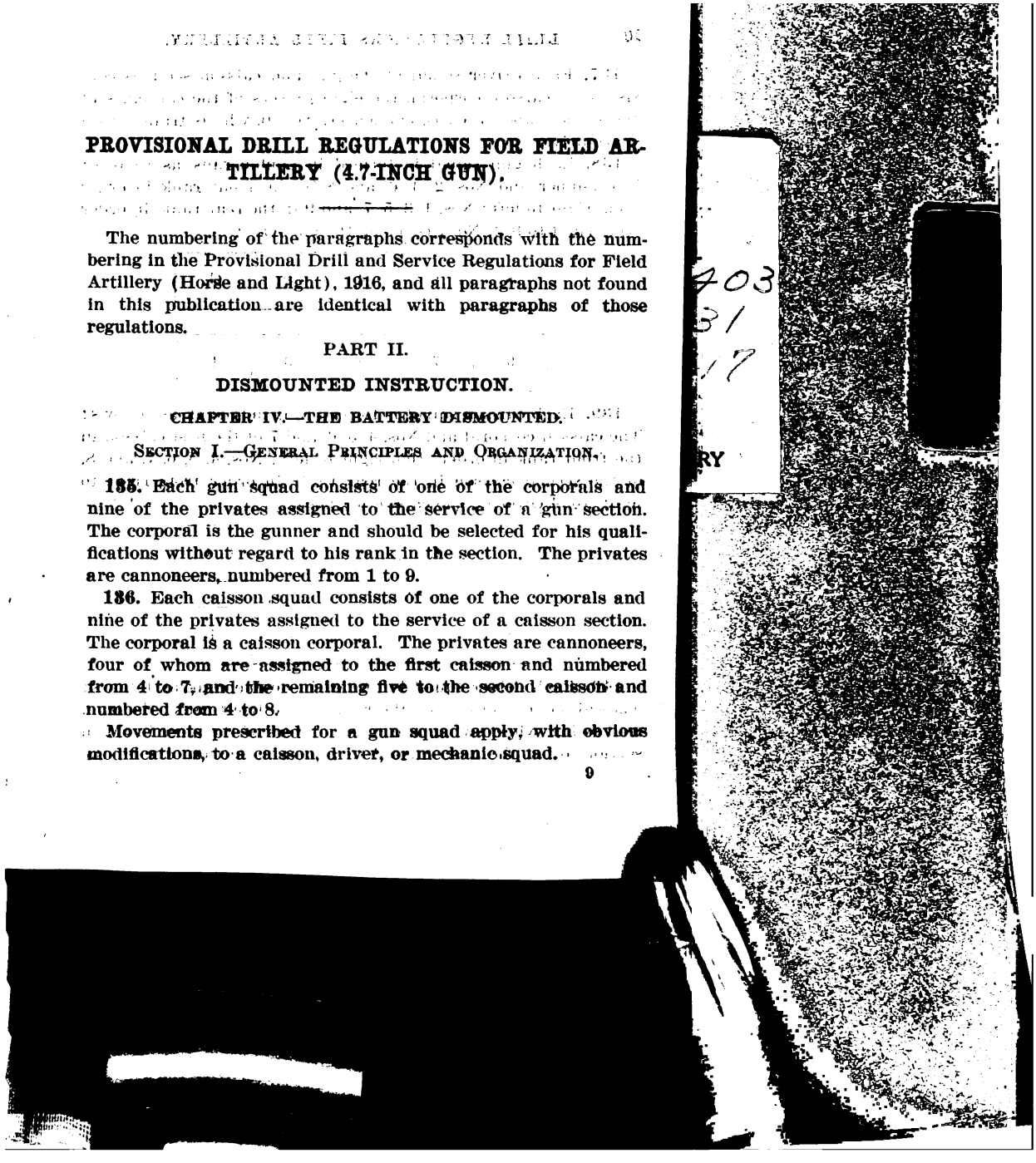
CHAPTER IV.—THE BATTERY DISMOUNTED.

SECTION I.—GENERAL PRINCIPLES AND ORGANIZATION.

185. Each gun squad consists of one of the corporals and nine of the privates assigned to the service of a gun section. The corporal is the gunner and should be selected for his qualifications without regard to his rank in the section. The privates are cannoneers, numbered from 1 to 9.

186. Each caisson squad consists of one of the corporals and nine of the privates assigned to the service of a caisson section. The corporal is a caisson corporal. The privates are cannoneers, four of whom are assigned to the first caisson and numbered from 4 to 7, and the remaining five to the second caisson and numbered from 4 to 8.

Movements prescribed for a gun squad apply, with obvious modifications, to a caisson, driver, or mechanic squad.



137. Each driver squad of the gun and caisson sections consists of a caisson corporal, the eight drivers of the carriages of the section, and an extra cannoneer, No. 10, who is trained as a spare driver.

138. Each gun squad is formed in double rank as follows: The gunner and Nos. 2, 4, 6, and 8 in the front rank in order from right to left; Nos. 1, 3, 5, 7, and 9 in the rear rank, in order from right to left, No. 1 covering the gunner.

8	6	4	2	G.

9	7	5	3	1

139. Each caisson squad is formed in double rank as follows: The caisson corporal and Nos. 4, 5, 6, and 7 of the first caisson in the front rank in order from right to left; Nos. 4, 5, 6, 7, and 8, of the second caisson in the rear rank, in order from right to left; No. 4 covering the caisson corporal.

7	6	5	4	C. C.

8	7	6	5	4

140. Each driver squad is formed in double rank as follows: The caisson corporal is on the right of the front rank; the lead, lead swing, wheel swing, and wheel drivers of the piece in a gun section, or of the first caisson in a caisson section, are on the

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left of the caisson corporal in order from right to left; the lead, lead swing, wheel swing, and wheel drivers of the caisson in a gun section, or of the second caisson in a caisson section, are in the rear rank in order from right to left covering the drivers of the front rank; the spare driver, No. 10, is in the rear rank covering the caisson corporal.

W.	W. S.	L. S.	L.	C. C.

W.	W. S.	L. S.	L.	10

CHAPTER V.—PRELIMINARY EXERCISES OF THE GUN SQUADS.

SECTION II.—POSTS OF GUN SQUADS AND CANNONEERS; MOUNTING AND DISMOUNTING.

Posts of the Cannoneers, Carriages Limbered.

180. The gunner and No. 1 opposite the rear of the gun wheels, Nos. 2 and 3 opposite the front of the gun wheels, Nos. 4 and 5 opposite the middle of the connecting pole of the caisson. Nos. 6 and 7 opposite the rear of the limber wheels of the piece.

Nos. 8 and 9 opposite the front of the limber wheels of the piece.

If the caisson corporal be present, dismounted, he is opposite the end of the pole of the caisson.

The gunner and even numbers are on the right, the caisson corporal and odd numbers on the left, all 2 feet outside the wheels facing to the front.

If numbers higher than No. 9 are present, they are assigned posts by the instructor.

183. In each gun squad the gunner mounts on the piece and No. 1 inside the turned back spade on the trail.

Nos. 2 and 3 mount on the limber chest of the caisson, faced to the front.

Nos. 4 and 5 mount on the caisson chest faced to the front.

Nos. 6 and 7 mount on the caisson chest faced to the rear.

Nos. 8 and 9 mount on the caisson limber chest faced to the rear.

In each caisson squad Nos. 4 and 5 mount on their respective caisson chests faced to the front; Nos. 6 and 7 mount on their respective caisson limber chests, faced to the front; No. 8 mounts on the caisson chest of the second caisson, faced to the rear. The spare drivers, if present, are distributed by the captain among the caissons of the combat train to be mounted on the caisson limber or caisson chests, faced to the rear.

In both gun and caisson squads even numbers mount on the right hand side of the carriage, odd numbers on the left.

184. 1. Cannoneers prepare to mount, 2. MOUNT. At the first command the Nos. 4 and 5 hasten to the front of the caisson chest, the Nos. 6 and 7 to the rear of the caisson chests while the Nos. 2 and 3 and 8 and 9 hasten to the rear of the caisson limber chests, the Nos. 8 and 9 in the rear of the Nos. 2 and 3 respectively. At the second command the Nos. 4 and 5 mount from the front and face to the front; the numbers 6 and 7 mount from the rear; the Nos. 2 and 3 mount from the rear and stepping over the caisson limber chests sit down on the chest faced to the front. The Nos. 8 and 9 mount after the Nos. 2 and 3 have assumed their positions.

At the first command the gunners and No. 1 hasten to the rear of the gun and the end of the trail, respectively, and on the second command mount in the most convenient manner.

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186. 1. Cannoneers prepare to dismount, 2. DISMOUNT. At the first command the cannoneers prepare to spring from the carriages, but do not stand. At the second command all cannoneers spring from the carriages in the direction in which they are facing in the most convenient manner and take their posts at the double time.

The Nos. 4 and 5 will not dismount until the Nos. 8 and 9 have dismounted and are out of the way.

Posts of the Cannoneers, Carriages Unlimbered.

188. The gunner, immediately in rear of the cannoneer's seat, on the left side of the trail of the gun.

No. 1, immediately in rear of the cannoneer's seat, on the right side of the trail of the gun.

No. 2, 2 feet in rear of the gunner, covering him.

Nos. 3, 4, and 5, 2 feet in rear of the caisson chest in the order named from right to left.

Nos. 6 and 7, at the ends of the trail handspikes, No 6 on the left.

The caisson corporal, if present dismounted, 2 feet in rear of the caisson limber chest.

Higher numbered cannoneers, if present, are posted at the discretion of the instructor. Unless otherwise directed, the cannoneers, when not serving the piece, stand at attention at their posts, facing to the front.

When serving the piece in either actual or simulated firing the gunner and No. 1 habitually seat themselves on the seats provided for them; the other cannoneers take as much shelter behind the carriages as is consistent with the proper performance of their duties.

190. The cannoneers being at their posts, carriages unlimbered: 1. **Change posts,** 2. **MARCH.**

No. 1 takes the post of No. 2; No. 2 of No. 3; No. 3 of No. 4; No. 4 of No. 5; No. 5 of No. 6; No. 6 of No. 7; No. 7 of No. 1.

SECTION III.—MOVEMENTS OF THE CARRIAGES BY HAND.

To Move by Hand the Carriages Limbered.

191. To the front: 1. Piece (Caisson) forward; 2. March; 3. HALT.

At the first command, the gunner and No. 1 each procure a picket rope and attach them to the wheel hooks on the right and left piece limber (caisson limber) wheels, respectively, stretching them in the direction the carriage is to be moved. The instructor assigns the necessary number of cannoneers to work at the end of the pole and on the picket ropes. At the command **march**, all working together move the piece (caisson) in the direction indicated. At the command **halt** the carriage is stopped, and all resume their posts.

NOTE.—It will sometimes be found advantageous to attach the middle of a picket rope around the doubletree bolt, drawing the ends out under the doubletree and giving them a half hitch around the end of the pole. By attaching additional ropes to these ends any desired length can be secured, and the piece, or caisson, moved as above described.

192. To the rear: 1. Piece (Caisson) backward; 2. March; 3. HALT.

Executed as in the preceding paragraph except that the ropes are attached to the wheel hooks of the piece (caisson), instead of to the wheel hooks of the limber.

193. In moving carriages by hand the cannoneers should be taught to place themselves alternately on each side of the rope

and to take sufficient distance so that they will not interfere with one another. They should be practiced in pulling together. For short distances five men well placed at a rope can pull more than a horse.

Whenever the cannoneers are used to assist in moving the carriages hitched, the rope should ordinarily be attached to the piece or caisson wheels instead of the limber wheels.

For short distances, on hard, level ground, the instructor may give directions for moving the carriages without attaching ropes.

SECTION IV.—DUTIES OF THE CANNONEERS IN UNLIMBERING.

Disposition of the Carriages Before and After Unlimbering.

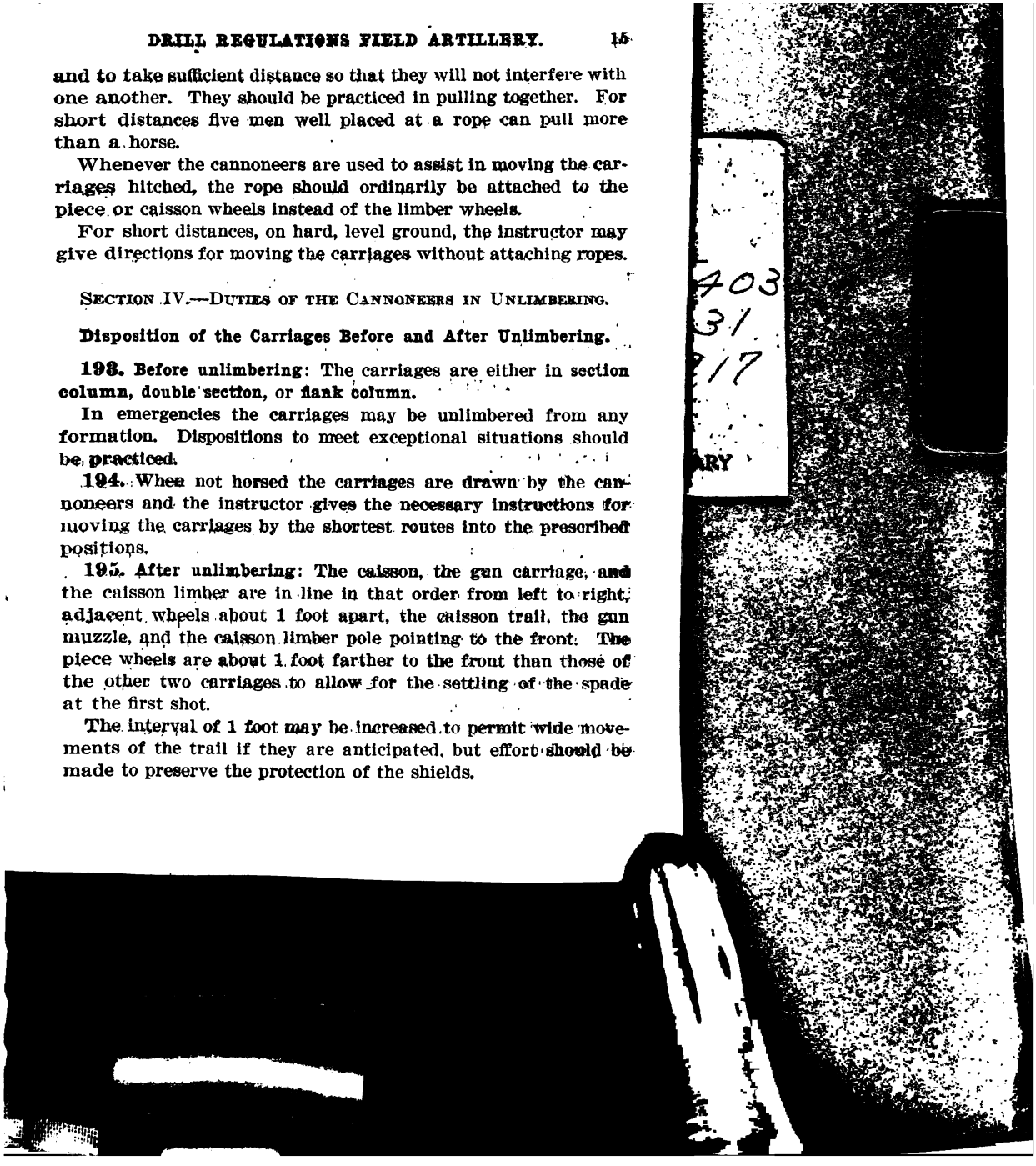
193. Before unlimbering: The carriages are either in **section column, double section,** or **flank column.**

In emergencies the carriages may be unlimbered from any formation. Dispositions to meet exceptional situations should be practiced.

194. When not horsed the carriages are drawn by the cannoneers and the instructor gives the necessary instructions for moving the carriages by the shortest routes into the prescribed positions.

195. After unlimbering: The caisson, the gun carriage, and the caisson limber are in line in that order from left to right, adjacent wheels about 1 foot apart, the caisson trail, the gun muzzle, and the caisson limber pole pointing to the front. The piece wheels are about 1 foot farther to the front than those of the other two carriages to allow for the settling of the spade at the first shot.

The interval of 1 foot may be increased to permit wide movements of the trail if they are anticipated, but effort should be made to preserve the protection of the shields.



196. In active service, and in instruction simulating service conditions, the teams are placed under cover in the vicinity of the position; if no cover is obtainable in the vicinity, they are placed in line in rear of either flank at such place as the instructor may designate.

When the tactical situation requires it the caisson limber, and if deemed advisable, the gun limber also, may be sent to the rear with the teams.

197. On occasions of ceremony, or when a post is not designated, the caisson limber is placed directly in rear of its caisson, the heads of the lead horses 25 yards in rear of the caisson, facing to the front. The piece team is placed on the right of the caisson team, 2 yards from and abreast of it.

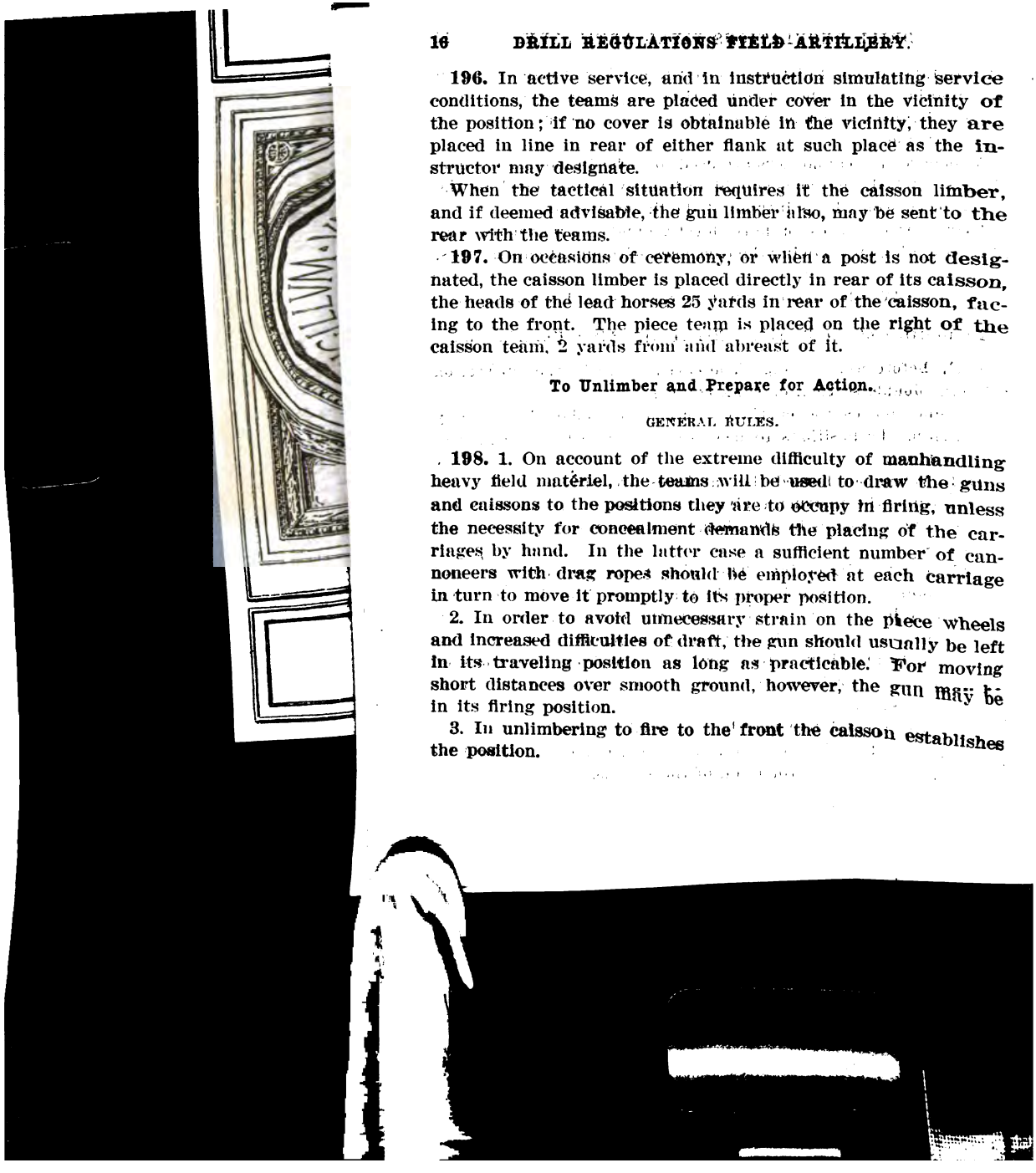
To Unlimber and Prepare for Action.

GENERAL RULES.

198. 1. On account of the extreme difficulty of manhandling heavy field matériel, the teams will be used to draw the guns and caissons to the positions they are to occupy in firing, unless the necessity for concealment demands the placing of the carriages by hand. In the latter case a sufficient number of cannoneers with drag ropes should be employed at each carriage in turn to move it promptly to its proper position.

2. In order to avoid unnecessary strain on the piece wheels and increased difficulties of draft, the gun should usually be left in its traveling position as long as practicable. For moving short distances over smooth ground, however, the gun may be in its firing position.

3. In unlimbering to fire to the front the caisson establishes the position.



4. In unlimbering to fire to the rear the piece establishes the position.

5. In preparing the piece for action the gunner and even numbers work on the left (gunner's) side of the trail, the odd numbers on the other side.

6. In pushing the gun into the firing position the cannoneers work on a maneuvering bar placed against the rear face of the breech; in returning it to the traveling position they work on the bar placed first against the front clip, then, to complete the movement, against the front face of the recoil lug.

7. The cannoneers report to the instructor if any parts of the matériel are not in working order.

DUTIES IN DETAIL OF THE CANNONEERS AT THE COMMAND FOR ACTION.

198½. The gunner and No. 1:

1. The gunner commands 1. **Piece,** 2. **HALT,** and sets the brake when the piece reaches its position. The gunner and No. 1, working together, remove the breech section of the gun cover, raise the top shield, and lower the apron.

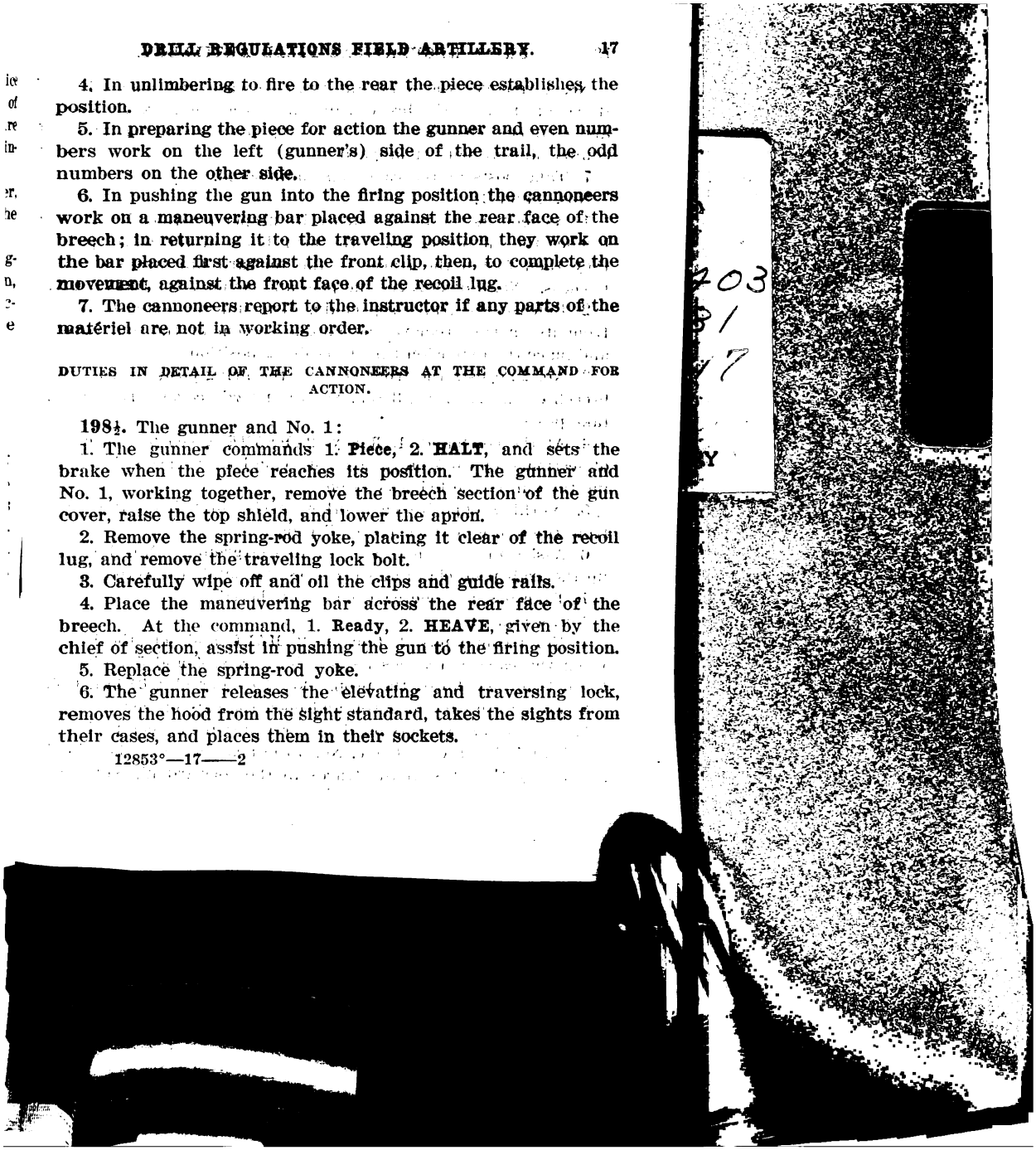
2. Remove the spring-rod yoke, placing it clear of the recoil lug, and remove the traveling lock bolt.

3. Carefully wipe off and oil the clips and guide rails.

4. Place the maneuvering bar across the rear face of the breech. At the command, 1. **Ready,** 2. **HEAVE,** given by the chief of section, assist in pushing the gun to the firing position.

5. Replace the spring-rod yoke.

6. The gunner releases the elevating and traversing lock, removes the hood from the sight standard, takes the sights from their cases, and places them in their sockets.



No. 1 removes the quadrant from its case and places it in its seat; operates the breech; examines the bore, breech block, and chamber, cleaning with waste any parts requiring it; and equips himself with a lanyard.

7. Take posts at the carriages unlimbered.

Nos. 2 and 3:

1. As soon as the piece reaches its proper position, No. 2 unhitches the off horse, No. 3 the near horse of the wheel pair; they then fasten the traces in the forward hip straps of the harness. No. 3 disengages the pole and commands: **DRIVE ON.**

2. Release the trail prop chain, dismount the extension rail from its carrier, remove the muzzle section of the gun cover, and place the extension rail in its firing position.

3. No. 2 adjusts the front sight in the firing position near the breech of the gun; No. 3 removes the muzzle cover. Both then take posts.

4. At the command, 1. **Ready,** 2. **HEAVE,** given by the chief of section, they work on the maneuvering bar and assist in pushing the gun to the firing position.

5. Working opposite each other, assist in raising the trail from the pintle, and set the trail prop.

6. Assist in lowering the trail to the ground. No. 3 hooks up the trail prop chain and procures the hand fuze setter.

7. Take posts at the carriages unlimbered.

Nos. 4 and 5:

1. No. 4 commands, 1. **Caisson,** 2. **HALT,** and sets the brake when the caisson reaches its position. Nos. 4 and 5 unlimber the caisson and lower the prop. No. 4 commands: **DRIVE ON.**

2. Lower the caisson apron and open the caisson chest.

3. As soon as the caisson limber reaches its proper position, No. 4 unhitches the off horse, No. 5 the near horse of the wheel pair; they then fasten the traces in the forward hip strap of

the harness. No. 5 disengages the pole and commands: **DRIVE ON.** Both then take posts near the breech of the gun.

4. At the command, 1. **Ready,** 2. **HEAVE,** given by the chief of section, they work on the maneuvering bar and assist in pushing the gun to the firing position.

5. No. 4 turns the pintle bolt lever 90°. Then, both working opposite each other nearest the spade, assist in raising the trail from the pintle; then they adjust the spade in its firing position.

6. Assist in lowering the trail to the ground, and open the caisson limber chest. No. 5 procures the cartridge hook.

7. Take posts at the carriages unlimbered.

Nos. 6 and 7:

1. Assist in removing the gun cover.

2. Assist Nos. 2 and 3 in placing the extension rail in its firing position.

3. Take posts near the breech of the gun.

4. At the command, 1. **Ready,** 2. **HEAVE,** given by the chief of section, they work against the maneuvering bar and assist in pushing the gun to its firing position.

5. Assist in unlimbering, working at the end of the limber pole.

6. Working at the trail handspikes, assist in lowering the trail to the ground. They then open the caisson limber chest.

7. Take posts at the carriages unlimbered.

To Fire to the Front.

199. The carriages being in double section: **ACTION FRONT.** Executed as in **action rear,** except that the caisson halts, and the piece moves forward, obliques away from the caisson, makes an about toward it, and takes its prescribed position.

199½. The carriages being in section column; **ACTION FRONT.** Executed as in **action rear,** except that the caisson halts and the

piece inclines to the left and takes its prescribed position by a right-about.

To Fire to the Rear.

200. The carriages being in double section: **ACTION REAR.**

The Piece: If marching, the piece halts. The gunner sets the brake; No. 2 unhitches the off wheel horse; No. 3 unhitches the near wheel horse, disengages the pole from the yoke, and commands, **DRIVE ON.** The piece team moves 10 yards straight to the rear and halts.

The Caisson: The caisson inclines sharply away from the piece, and by and about toward it, takes its prescribed position. When the caisson reaches its position, No. 4 commands, 1. **Caisson,** 2. **HALT,** and sets the brake. No. 4 unlatches the pintle, No. 5 lowers the prop; Nos. 4 and 5 raise the connecting pole from the pintle, and No. 4 commands: **DRIVE ON.** Nos. 4 and 5 lower the apron and open the doors of the caisson chest. The limber, moving at a walk, makes a left about, goes straight to the rear until it clears the heads of the lead pair of the piece team, when it makes a second left about and comes up on the right of the gun. No. 4 commands, 1. **Limber,** 2. **HALT,** when the axle of the limber is approximately in prolongation of the axle of the caisson. No. 4 unhitches the off wheel horse. No. 5 unhitches the near wheel horse, disengages the pole from the yoke, and commands: **DRIVE ON.** The caisson team makes a left about and moves up abreast of the piece team.

Teams: When the caisson team arrives abreast of the piece team they take their prescribed positions. To take posts in rear of the carriages, the teams move out together at a walk. They incline well to the right, move to the rear about 50 yards, execute a left about, and halt so that the heads of the lead horses of the caisson team will be 25 yards in rear of the caisson limber. The

piece team is on the left of the caisson team, 2 yards from and abreast of it.

200½. The carriages being in section column: **ACTION REAR.** Executed as prescribed in the preceding paragraph, except that the caisson inclines to the left and takes its position by a right-about.

To Fire to the Flank.

201. Being in flank column or in double section, the carriages are usually marched by the flank, and the command **action front** or **action rear** is then given.

If the carriages are in flank column with the piece on the side toward which fire is to be directed, the movement may be executed as follows: **ACTION RIGHT (LEFT).** The carriages wheel toward each other, the teams keeping to the left in passing. The piece halts as soon as it completes the change of direction; the caisson halts when it reaches its prescribed position. The movement is then completed in accordance with the principles laid down in the preceding paragraphs.

SECTION V.—DUTIES OF THE CANNONEERS IN LIMBERING.

To Resume the Order for Marching.

202. The carriages being unlimbered and prepared for action: **MARCH ORDER.**

DUTIES IN DETAIL OF THE CANNONEERS.

The Gunner and No. 1.

1. The gunner replaces the sights, secures the hood over the sight standard, traverses and depresses the piece to zero, and fastens the elevating and traversing lock. No. 1 removes the

quadrant and puts it in its case, replaces the lanyard in the trail box, releases the brake if set.

2. After the trail has been raised, they remove the spring-rod yoke, and raise the rear traveling lock leg.

3. Place the maneuvering bar against the front clip of the gun; at the command: 1. **Ready**, 2. **HEAVE**, given by the chief of section, they assist in pushing the gun about 2 feet toward the traveling position; then change the maneuvering bar to the front face of the recoil lug. At the command: 1. **Ready**, 2. **HEAVE**, again given by the chief of section, they assist in completing the change to the traveling position.

4. Secure the lock bolt, replace the spring-rod yoke, and carefully wipe off with dry waste the clips and guide rails.

5. Lower the top shield, raise the apron, and replace the breech section of the gun cover.

6. The gunner takes post at the right caisson wheel, facing toward the end of the connecting pole; No. 1 takes the corresponding position at the left caisson wheel.

Nos. 2 and 3.

1. Spring to the trail, and, working opposite each other, assist in raising the trail; set the prop, No. 3 releasing the trail prop chain. No. 3 returns the hand fuse setter to the tool box.

2. Assist in raising the trail and in limbering. No. 3 hooks up the trail prop chain.

3. At the command: 1. **Ready**, 2. **HEAVE**, given by the chief of section, they work against the maneuvering bar and assist in pushing the gun about 2 feet toward the traveling position. When the gunner changes the bar to the front of the recoil lug, Nos. 2 and 3 remain at the muzzle and at the command: 1. **Ready**, 2. **HEAVE**, again given by the chief of section, they push

against the muzzle, and assist in completing the change to the traveling position.

4. No. 2 adjusts the front sight in its traveling position. No. 3 puts on the muzzle cover. They then dismount the extension rail and secure it in its carrier.

5. Replace the muzzle section of the gun cover.

6. No. 2 takes post at the singletree of the off wheel horse of the piece, 2 feet outside the wheel, facing toward the end of the pole. No. 3 takes the corresponding position at the singletree of the near wheel horse.

Nos. 4 and 5.

1. Spring to the trail, and, working opposite each other nearest the spade, assist in raising the trail. Remove the spade key and replace the spade in its traveling position.

2. Assist in raising the trail and in limbering. No. 4 manipulates the pintle bolt lever.

3. At the command: 1. Ready, 2. HEAVE, given by the chief of section, they work against the maneuvering bar and assist in pushing the gun to the traveling position.

4. Close the caisson chest and raise the caisson apron.

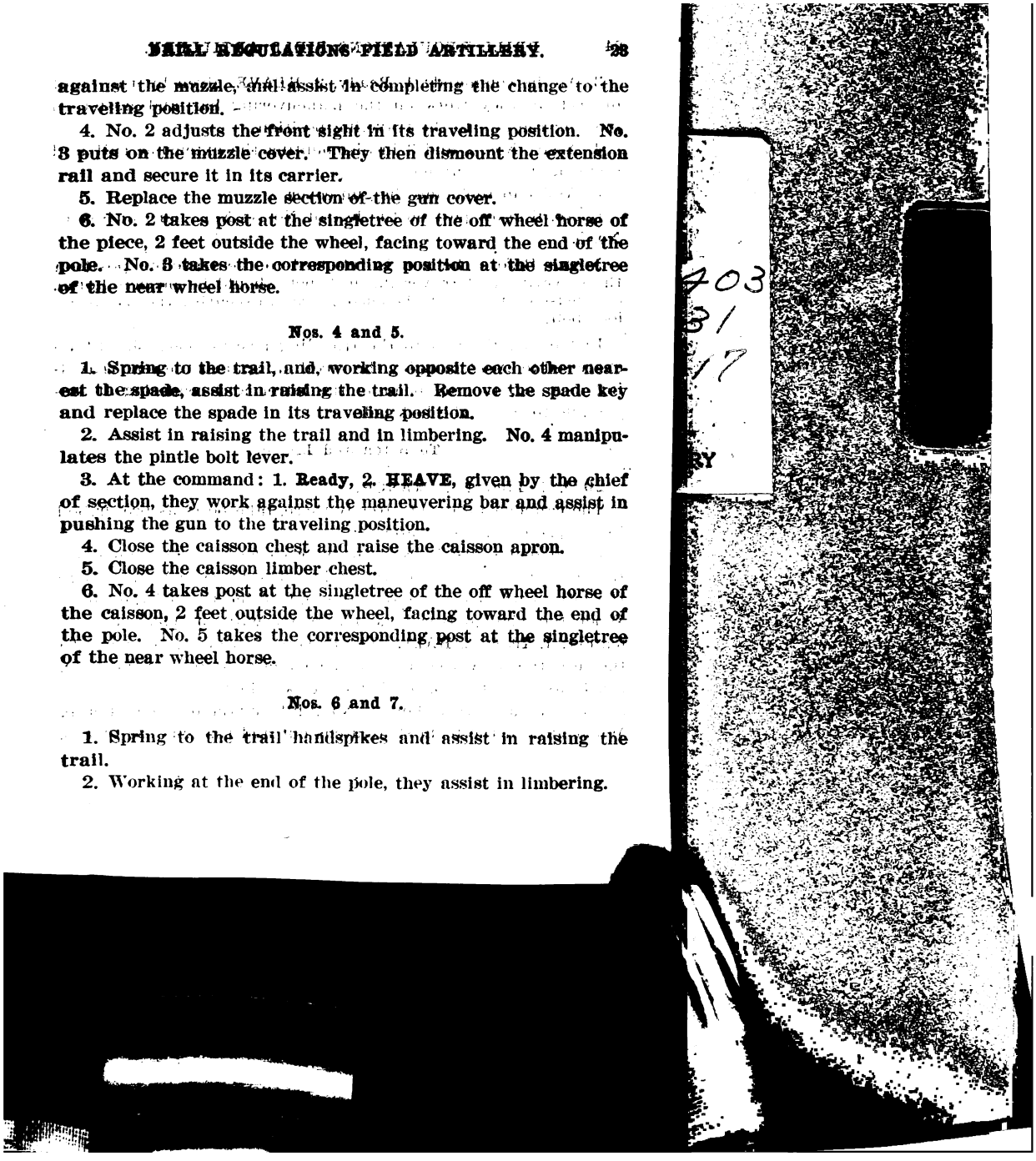
5. Close the caisson limber chest.

6. No. 4 takes post at the singletree of the off wheel horse of the caisson, 2 feet outside the wheel, facing toward the end of the pole. No. 5 takes the corresponding post at the singletree of the near wheel horse.

Nos. 6 and 7.

1. Spring to the trail handspikes and assist in raising the trail.

2. Working at the end of the pole, they assist in limbering.



3. At the command: 1. **Ready**, 2. **HEAVE**, given by the chief of section, they work on the maneuvering bar and assist in pushing the gun to the traveling position.

4. Assist Nos. 2 and 3 in dismounting the extension rail and securing it in its carrier.

5. Assist in replacing the gun cover.

6. No. 6 takes post on the left of No. 3; No. 7 on the left of No. 5.

NOTE.—Before the gun is returned to the traveling position the elevating and traversing lock bolt should be pushed home, otherwise difficulty will be encountered in securing the traveling lock bolt.

In pushing the gun to the traveling position care should be exercised to avoid jamming the recoil lug against the rear traveling lock leg, thereby bending the latter and rendering it impossible to insert the lock bolt.

To Hitch and Limber.

202½. 1. **Limber**, 2. **MARCH.**

The cannoneers, if not already there, take posts as prescribed in the preceding paragraphs.

If the teams are in rear of their carriages, they move out together, inclining well to the right. The piece team wheels to the left so as to move across the end of the pole of the piece. When the wheel driver is nearly in line with the pole, he commands: 1. **Team**, 2. **HALT.** The drivers then swing the team to the left, the off wheel horse being made to step over the pole. No. 3, assisted by No. 6, places the pole in the neck yoke and hitches the near wheel horse. No. 2 hitches the off wheel horse. When hitched the team straightens out and tightens the traces.

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After moving far enough to the front the caisson team wheels to the left so as to move across in front of the caisson limber. It is halted at the command of the wheel driver, and swung to the right. No. 5, assisted by No. 7, places the pole in the neck yoke and hitches the near wheel horse. No. 4 hitches the off wheel horse. When the team has been hitched and has straightened out and tightened the traces, No. 4 commands: **DRIVE ON.** Nos. 4 and 5 hasten to the front of the caisson. No. 4 releases the brakes; Nos. 4 and 5 then place themselves with their backs toward the chest, No. 4 on the right, No. 5 on the left of the connecting pole. At the command drive on, the caisson limber moves to the front, makes a left about, and is brought back so as to move across in front of the caisson, the right wheel passing within about a foot of the lunette. When the axle of the limber is nearly in line with the connecting pole of the caisson, No. 4 commands: 1. Limber, 2. **HALT.** The limber is then swung to the left, the wheels turning equally in opposite directions, and is halted in front of the caisson. With Nos. 2 and 6 assisting at the right wheel, and Nos. 3 and 7 at the left wheel, the caisson limber is then backed to its position. Nos. 4 and 5 raise the connecting pole of the caisson and place the lunette over the pintle. No. 4 latches the pintle. No. 5 secures the prop in its traveling position. The gunner and No. 1 assist in limbering the caisson by working at the right and left caisson wheels respectively. All the cannoneers take their posts at the carriages limbered.

If the teams are posted on the flank, they approach the carriages in section column and separate as they reach the vicinity of the carriages, the piece team passing along the rear, the caisson team along the front of the position. Each team proceeds to its own carriage and is hitched as prescribed above.

203. Does not apply.

PART III.

MOUNTED INSTRUCTION.

CHAPTER III.—THE DRIVER.

SECTION III.—PRELIMINARY INSTRUCTION.

408. In the field.

The piece team: The neck yoke is placed as a support under the end of the pole. The wheel traces are detached from the collars only, and laid back on the doubletree.

The remainder of the harness of the wheel horses is placed on the bucket brackets of the limber, the off harness on the right.

The harness of the near wheel swing horse is placed on the pole next to the doubletree, arranged as follows: The saddle with its attachments over it, the blanket across the saddle, the bridle and collar over the blanket. The off wheel swing harness is placed next, then the lead swing and the lead harness in the same order. The traces of the wheel swing, lead swing, and lead harness, folded once, are placed across the saddle.

The caisson team: The pole prop is placed under the end of the pole. The harness of the caisson team is arranged as for the piece team except that the harness of the wheel horses is placed on the doubletree, the off harness on the right. The neck yoke is placed on the limber.

SECTION IV.—MOUNTED INSTRUCTION.

428½. Necessary changes in distances and intervals due to the increased length of carriages and teams should be made. The length of the piece hitched with team of 4 pairs, the gun in its traveling position, is about 19 yards; that of the caisson hitched with team of 4 pairs is about 18 yards. The distance between carriages in section column should be about 4 yards.

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The interval between carriages in line and flank column is about 21 yards. The radius to be used in making the wheels and the abouts is not fixed, but varies with the degree of draft from 6 to 12 yards; it should be sufficiently large to permit the team to make the movement with ease, all the pairs keeping in draft.

When it becomes necessary to increase or decrease distances or intervals, the changes should be made very gradually.

The usual maneuvering gait is the walk; the trot is exceptional. The gallop is not used for teams or carriages hitched.

Owing to the difficulty of obtaining precision of maneuver with the heavy field artillery guns, movements into firing positions should, when practicable, be successive rather than simultaneous.

PART IV.

CHAPTER I.—THE BATTERY MOUNTED.

SECTION VIII.—MANEUVERS OF THE BATTERY.

Gaits.

516. The 4.7-inch gun batteries normally execute all movements at a walk; but on good roads, or for short distances, or under conditions imperatively requiring a faster gait they may take the trot.

SECTION IX.—TO SUBDIVIDE THE BATTERY FOR ACTION.

550. Does not apply.

SECTION X.—TO FORM IN BATTERY AND TO RESUME A MARCHING FORMATION.

565. Does not apply.

PART VII.

CEREMONIES.

CHAPTER I.—GENERAL RULES.

699. At formations for ceremony sabers are drawn. At ceremonies mounted the pieces are in front unless the formation is in double section. Mounted officers in facing toward the line and in resuming their front always execute a left about.

Staff officers, when not otherwise prescribed, draw and return saber with their chief.

In 4.7-inch gun batteries the cannoneers are normally formed in detachments marching in rear of their pieces and caissons.

Each gun squad marches in rear of its piece, and each caisson squad in rear of the leading caisson of its section.

CHAPTER II.—REVIEWS.

SECTION I.—GENERAL RULES.

715. The 4.7-inch gun batteries normally pass in review at the walk only.

SECTION II.—BATTALION REVIEW.

720. The battalion being in line, the major faces to the front, his staff taking post in his rear; the reviewing officer moves a few yards toward the major and halts; the major turns about, commands: 1. **Present**, 2. **SABER**, and again turns about and salutes.

The reviewing officer returns the salute; the major turns about, brings the battalion to carry saber and again turns to the front.

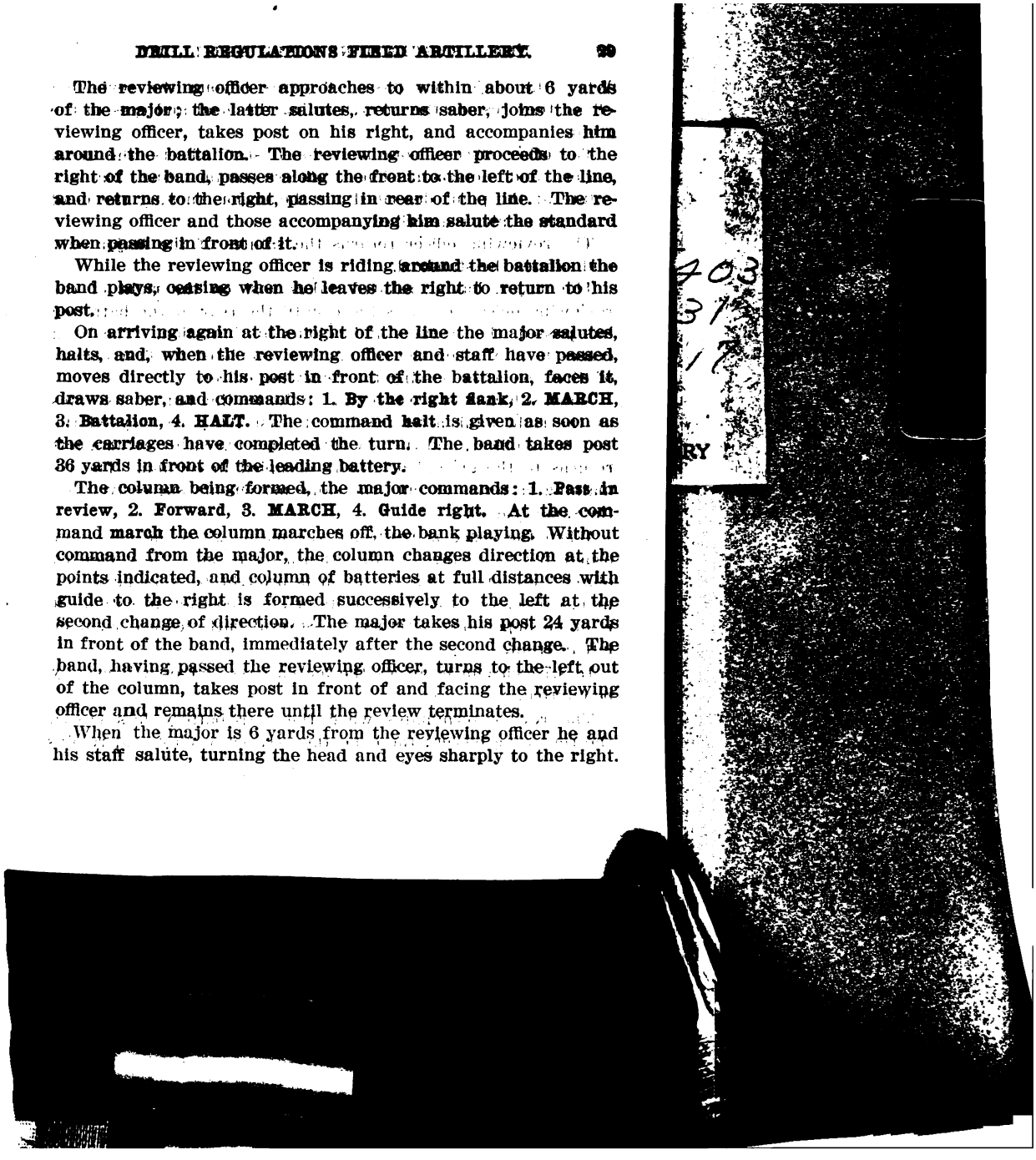
The reviewing officer approaches to within about 6 yards of the major; the latter salutes, returns saber, joins the reviewing officer, takes post on his right, and accompanies him around the battalion. The reviewing officer proceeds to the right of the band, passes along the front to the left of the line, and returns to the right, passing in rear of the line. The reviewing officer and those accompanying him salute the standard when passing in front of it.

While the reviewing officer is riding around the battalion the band plays, ceasing when he leaves the right to return to his post.

On arriving again at the right of the line the major salutes, halts, and, when the reviewing officer and staff have passed, moves directly to his post in front of the battalion, faces it, draws saber, and commands: 1. **By the right flank**, 2. **MARCH**, 3. **Battalion**, 4. **HALT.** The command **halt** is given as soon as the carriages have completed the turn. The band takes post 36 yards in front of the leading battery.

The column being formed, the major commands: 1. **Pass in review**, 2. **Forward**, 3. **MARCH**, 4. **Guide right.** At the command **march** the column marches off, the bank playing. Without command from the major, the column changes direction at the points indicated, and column of batteries at full distances with guide to the right is formed successively to the left at the second change of direction. The major takes his post 24 yards in front of the band, immediately after the second change. The band, having passed the reviewing officer, turns to the left out of the column, takes post in front of and facing the reviewing officer and remains there until the review terminates.

When the major is 6 yards from the reviewing officer he and his staff salute, turning the head and eyes sharply to the right.



When the major has passed 6 yards beyond the reviewing officer they resume the carry, turning the head and eyes to the front.

The other officers, noncommissioned staff officers, the drum major, and noncommissioned officers commanding platoons salute at the point described for the major, turning the head and eyes as above described.

The reviewing officer returns the salutes of the major only and salutes the standard.

The major, having saluted, takes post on the right of the reviewing officer, remains there until the rear of the battalion has passed, then salutes and rejoins his battalion. The band ceases to play when the column has completed its first change of direction after passing the reviewing officer.

When sufficient space is available the leading battery executes by the right flank after passing at least 100 yards beyond the reviewing officer, and then by three times executing column left returns to the ground originally occupied in column. The remaining batteries execute the same movements successively on the same ground.

When the space is restricted the major gives the necessary orders for the changes of direction after passing the reviewing officer. So long as the battalion is brought back in flank column, caissons on the right, to its original position in column it is of no importance whether the several batteries are right or left in front.

In 4.7-inch gun batteries the march pass at trot will usually be omitted.

The review terminates when the rear battery has passed the reviewing officer; the band then ceases to play and rejoins

the battalion or is dismissed. The major and his staff rejoin the battalion.

The reviewing officer may prescribe how often the column shall pass in review and the gait or gaits to be used.

CHAPTER III.—INSPECTIONS.

SECTION III.—BATTERY INSPECTION.

Mounted.

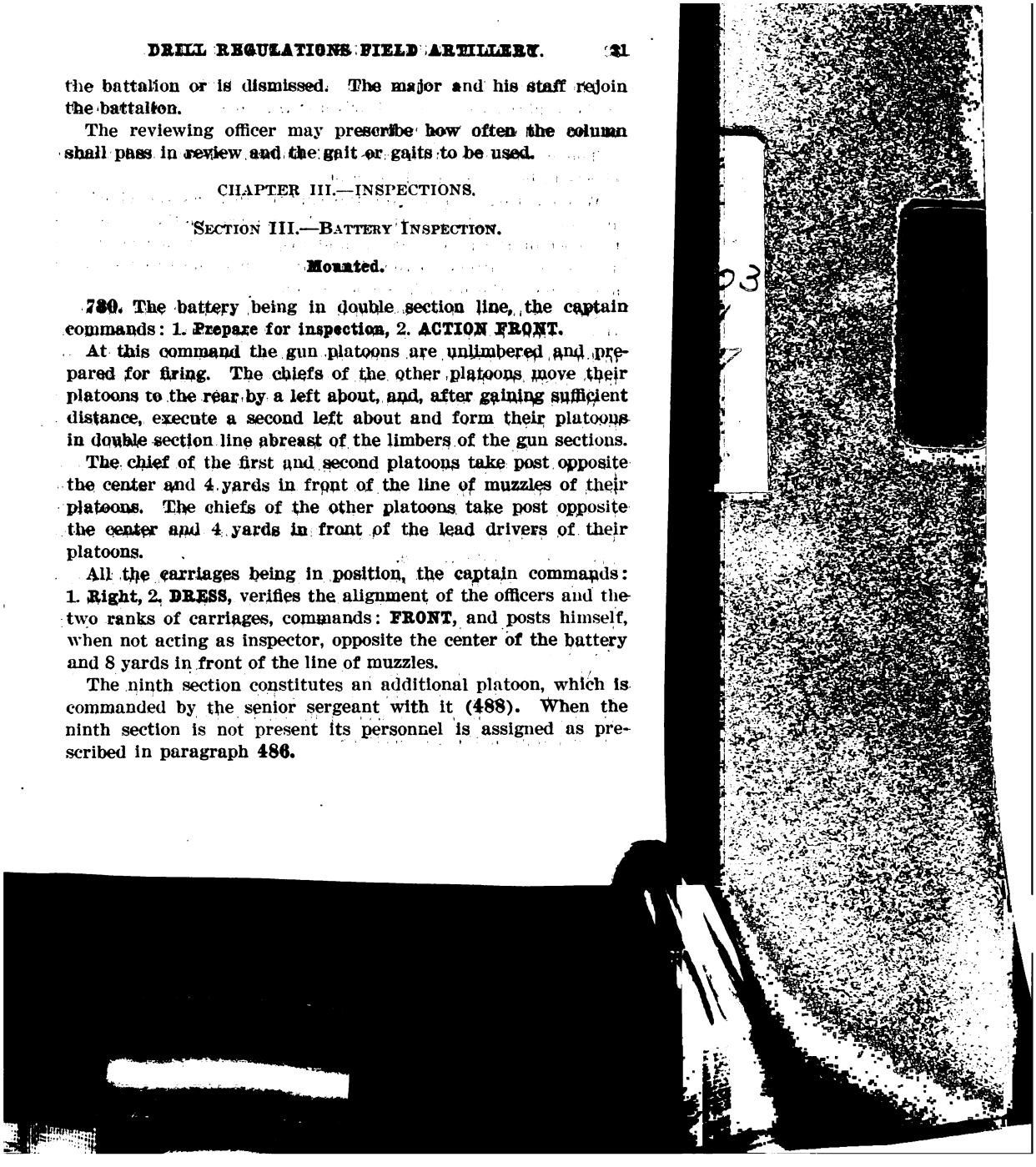
780. The battery being in double section line, the captain commands: 1. **Prepare for inspection,** 2. **ACTION FRONT.**

At this command the gun platoons are unlimbered and prepared for firing. The chiefs of the other platoons move their platoons to the rear by a left about, and, after gaining sufficient distance, execute a second left about and form their platoons in double section line abreast of the limbers of the gun sections.

The chief of the first and second platoons take post opposite the center and 4 yards in front of the line of muzzles of their platoons. The chiefs of the other platoons take post opposite the center and 4 yards in front of the lead drivers of their platoons.

All the carriages being in position, the captain commands: 1. **Right,** 2. **DRESS,** verifies the alignment of the officers and the two ranks of carriages, commands: **FRONT,** and posts himself, when not acting as inspector, opposite the center of the battery and 8 yards in front of the line of muzzles.

The ninth section constitutes an additional platoon, which is commanded by the senior sergeant with it (**488**). When the ninth section is not present its personnel is assigned as prescribed in paragraph **486.**



The guidon is 4 yards from the right flank of the line of limbers, abreast of the lead drivers; the musicians on the right of the guidon, all boot to boot.

The chiefs of section cause all limber, caisson, and wagon chests to be opened for inspection.

When acting as inspector the captain inspects the chiefs of platoon from right to left; passes by the rear of the battery to the post of the first sergeant and inspects him; thence by the rear of the battery to the right flank, where he returns saber and inspects the musicians and guidon.

He goes to the right section of the right platoon and inspects the section, commencing with the chief of section, passing in order to the caisson, the gun, and the limbers. He then similarly inspects the other sections in order from right to left.

When the captain commences the inspection of the right platoon the chiefs of the other platoons cause their platoons to stand **at ease**, calling them to **attention** as the captain approaches their platoons. Each chief of platoon accompanies the captain during the inspection of his platoon. As soon as a platoon is inspected its commander causes it to take the **march order** and then to stand **at ease**. The platoon commander faces his platoon while **at ease**.

The inspection being completed, in 4.7-inch gun batteries the captain will limber in the normal manner as for any other movement, and command: 1. **Form double section line,** 2. **MARCH.**

At the second command the first and second platoons execute the movement (568); the chiefs of the other platoons move their platoons in double section up on the line established by the caissons of the gun sections.

PART IX.

FIRING INSTRUCTION.

CHAPTER II.—THE CANNONEERS.

SECTION III.—DUTIES IN DETAIL OF THE GUNNER.

854. The range scale on the sight shank is graduated from 100 to 9,400 yards, the least reading being 50 yards. The scale may be readily set by eye to read to 25 yards.

To set off a range on the sight shank: The gunner moves the sight shank up or down in its socket until the desired graduation is opposite the index. In setting the range he is careful to lower his head so as to look squarely at the scale and the index.

The sight shank is moved up or down by means of a scroll gear operated with the right hand. If a considerable movement of the shank is necessary this mechanism is ungeared by drawing outward the scroll-gear handle with the right hand; the shank is then raised or lowered with the left hand until the desired graduation is near the index. The scroll-gear mechanism is then thrown in gear and utilized to set the scale at the exact setting desired.

SECTION IV.—DUTIES IN DETAIL OF NO. 1.

880. In indirect laying the range is set off on the range disk of the quadrant. The range disk is graduated from zero to 9,400 yards. The least reading on the scale is 50 yards, but the range may readily be set by eye to a least reading of 25 yards.

SECTION V.—DUTIES IN DETAIL OF No. 2.

892. The duties of No. 2 in the service of the piece are:

1. To receive the round from No. 4.
2. To insert the round in the breech.
3. To throw the empty cartridge cases out of the way of the gun squad.

893. Does not apply.
894. Does not apply.
895. Does not apply.
896. Does not apply.
897. Does not apply.
898. Does not apply.
899. Does not apply.
900. Does not apply.

To Receive the Round and to Insert It in the Breech.

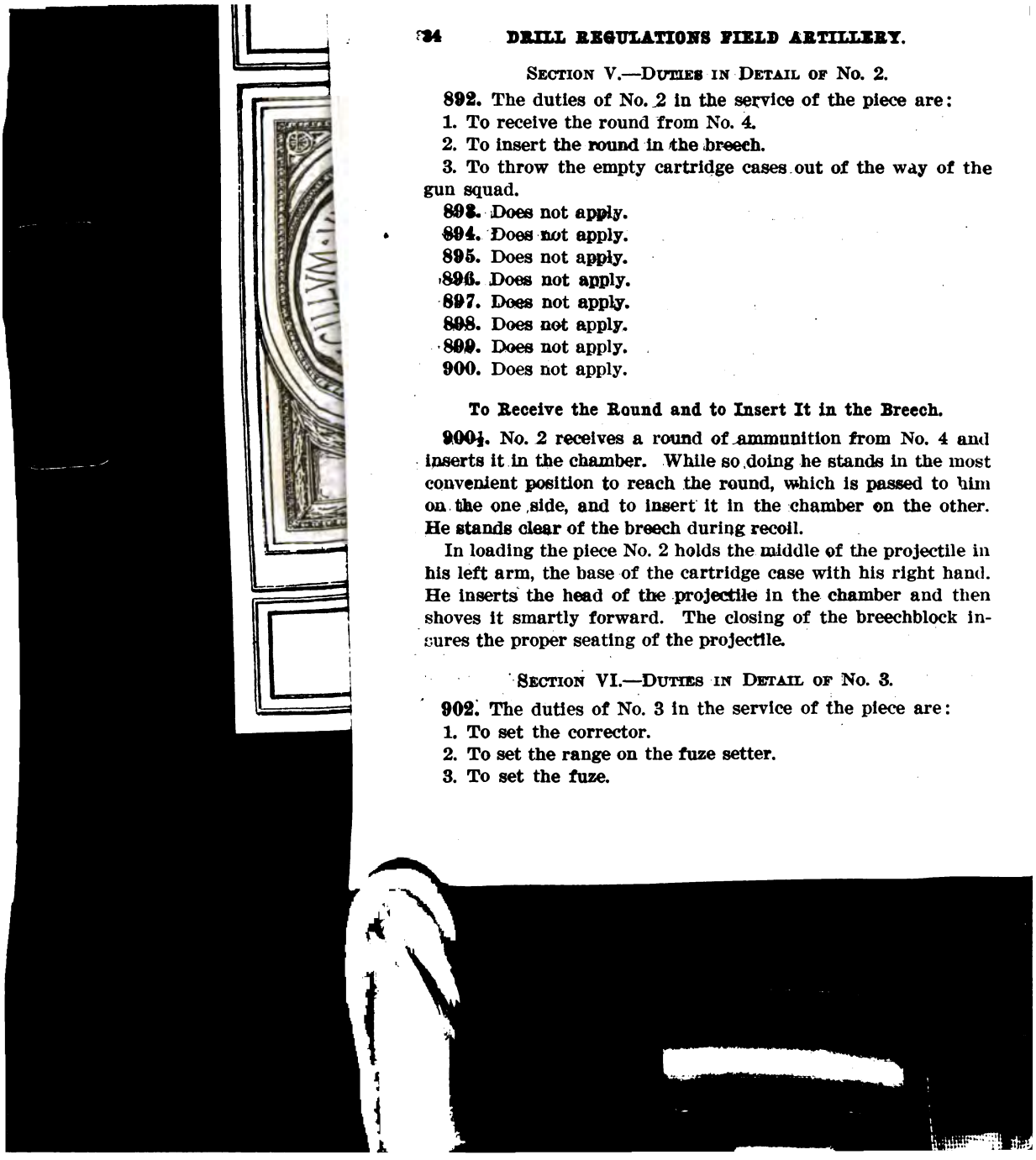
900½. No. 2 receives a round of ammunition from No. 4 and inserts it in the chamber. While so doing he stands in the most convenient position to reach the round, which is passed to him on the one side, and to insert it in the chamber on the other. He stands clear of the breech during recoil.

In loading the piece No. 2 holds the middle of the projectile in his left arm, the base of the cartridge case with his right hand. He inserts the head of the projectile in the chamber and then shoves it smartly forward. The closing of the breechblock insures the proper seating of the projectile.

SECTION VI.—DUTIES IN DETAIL OF No. 3.

902. The duties of No. 3 in the service of the piece are:

1. To set the corrector.
2. To set the range on the fuze setter.
3. To set the fuze.



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903. The bracket fuze setter is not used with the 4.7-inch matériel. The description given in paragraph 903, Provisional Drill and Service Regulations for Field Artillery (Horse and Light), applies in general to the 4.7-inch hand fuze setter, the range scale being graduated from 0 to 9,700 yards.

908. No. 3 is repeatedly practiced in setting the scale of the fuze setter by command.

The caisson being in position No. 3 places his back to the caisson and faces the upright shrapnel which has been removed from the caisson by No. 5. The instructor then commands for example: 1. **Corrector 28,** 2. **3,600.**

1. No. 3 sets off the corrector as soon as it is announced.
2. Sets the range scale at the range ordered.

The instructor verifies the settings.

911. The hand fuze setter is habitually used with the 4.7-inch matériel. No. 3 sets the scales in a manner similar to that described for the bracket fuze setter (**903**). He also sets the fuze, No. 4 holding the round. To set the fuze with the hand, fuze setter No. 3 engages the fuze setter on the fuze and turns the fuze setter to the right with a steady and uniform motion until the lug on the fuze comes firmly against the fuze-setter stop.

Section VII.—Duties in Detail of No. 4.

912. The duties of No. 4 in the service of the piece are:

1. To receive round from No. 5.
2. In time fire to hold the shrapnel for No. 3 to set the fuze.
3. To pass projectile to No. 2.
4. In volley fire to call out number of round.

914. Does not apply.

915. Does not apply.

915½. In time fire No. 4 receives a round from No. 5, places it base downward on the ground, and removes the waterproof cover. He holds each round while No. 3 sets the fuze, and then passes it to No. 2.

In percussion fire, he receives the ammunition from No. 5 and passes it at once to No. 2.

916. Does not apply.

917. Does not apply.

SECTION VIII.—DUTIES IN DETAIL OF NO. 5.

919. The duties of No. 5 in the service of the piece are:

1. To take ammunition from the chest.
2. To pass the round to No. 4.

920. To take a round from the chest, No. 5 places himself to the left rear of the round selected, grasps the edge of the cartridge case with the cartridge hook held in the right hand, starts the round to the rear, drops the cartridge hook, grasps the base of the cartridge case with both hands, pulls the round to the rear until he can catch the front of the projectile in the hollow of left arm, and passes it to No. 4. As soon as he is relieved of one round, No. 5 immediately takes another from the chest.

921. Does not apply.

922. Does not apply.

923. Does not apply.

924. Does not apply.

SECTION IX.—DUTIES OF NOS. 6 AND 7.

925. The duties of Nos. 6 and 7 in the service of the piece are:

1. To shift trail so as to give the general direction of the piece.

926. Does not apply.

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To shift the Trail.

926¼. For the assistance of No. 6, the trail spade should be marked on either side of the center to indicate changes of direction of 25, 50, and 75 mils. These markings correspond roughly with distances of 3.15, 6.3, and 9.45 inches from the center.

926½. To shift the trail Nos. 6 and 7 stand immediately in rear of the trail handspikes, No. 6 on the left, No. 7 on the right, feet about 18 inches apart, and grasp their respective handspikes with both hands.

When the target is visible and direct laying is used, No. 6 sights along the barrel and assisted by No. 7 shifts the trail so as to point the gun directly at the target. Unless the target is moving it should not be necessary to shift the trail during the firing. In the case of moving targets, Nos. 6 and 7 after once pointing the piece at the target, do not shift the trail until they get the gunner's command: **Muzzle right (left).** They then shift the trail so as to bring the piece again on the target.

Whenever it is necessary to shift the trail in direct laying No. 6 watches the gunner and does not have the shifting of the trail completed until the gunner has traversed the gun to the center or to one extreme of its movement on the carriage **(864).**

Nos. 6 and 7 are practiced in pointing the piece directly at the target.

The piece being in position and Nos. 6 and 7 at the trail handspike the instructor commands for example: **Target that house.**

Nos. 6 and 7 point the piece quickly on the designated target.

The instructor verifies the pointing with the panoramic sight set at zero deflection.

926¾. When the piece is laid for direction by the use of an aiming point (indirect laying), Nos. 6 and 7 give the original

direction to the piece by shifting the trail in accordance with the commands or signals of the chief of section, or of some one representing the chief of section.

To signal No. 6 the chief of section extends his arm toward the trail, palm of the hand turned and fingers pointing in the direction in which the trail is to be moved. To indicate that the direction is correct and that the trail is to be lowered, the chief of section commands: **Trail down**; the corresponding signal is the bringing of the extended arm sharply to the side.

Nos. 6 and 7 are practiced in giving the piece its initial pointing in indirect laying. In these exercises an aiming point is taken, the sight is set at an appropriate reading and the chief of section, looking along a side of the rotating head, causes the gun to be given its proper direction.

No. 6 should also be instructed as to what should be the approximate direction of the piece when the sight set at different deflections is directed on an aiming point.

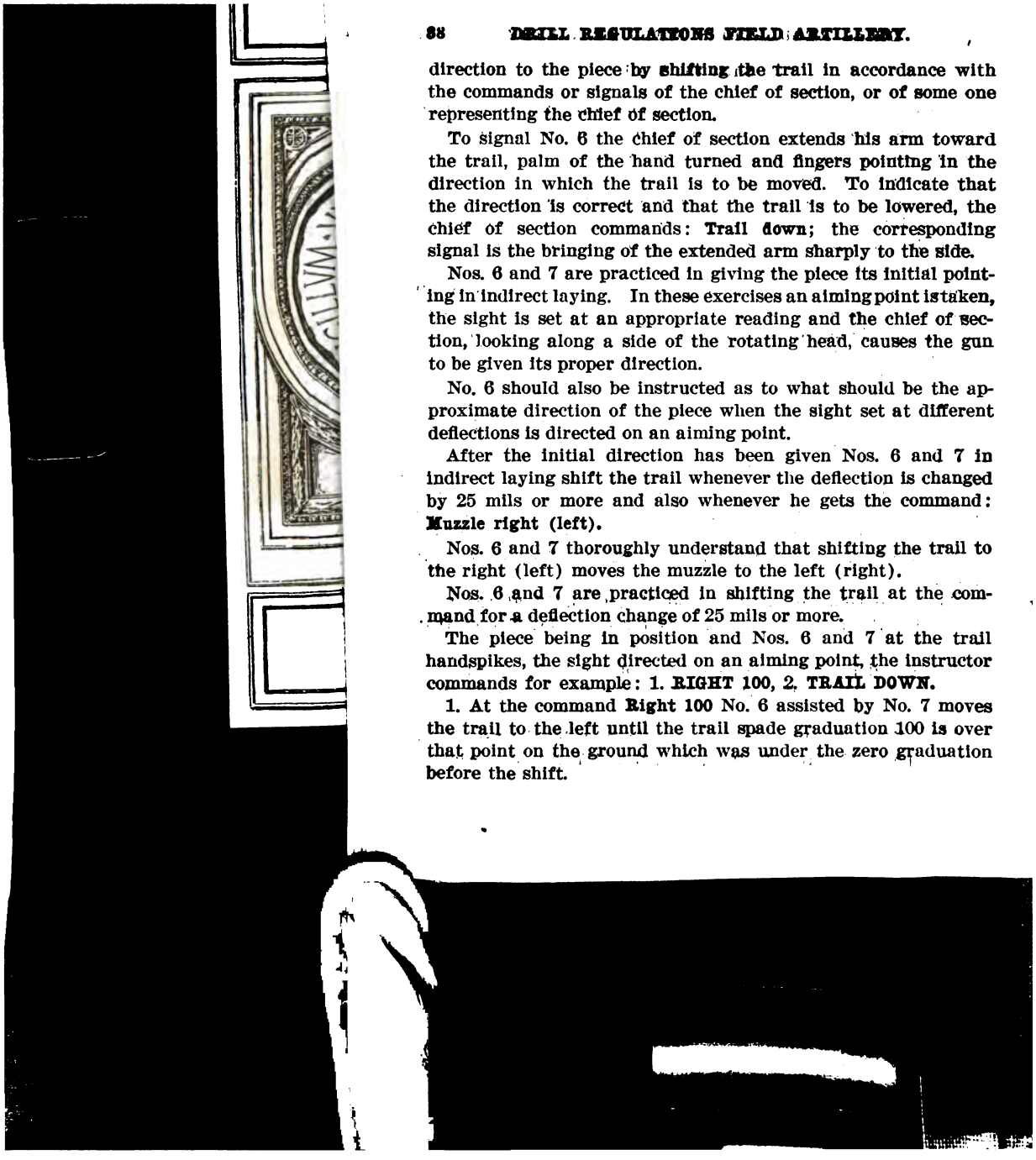
After the initial direction has been given Nos. 6 and 7 in indirect laying shift the trail whenever the deflection is changed by 25 mils or more and also whenever he gets the command: **Muzzle right (left).**

Nos. 6 and 7 thoroughly understand that shifting the trail to the right (left) moves the muzzle to the left (right).

Nos. 6 and 7 are practiced in shifting the trail at the command for a deflection change of 25 mils or more.

The piece being in position and Nos. 6 and 7 at the trail handspikes, the sight directed on an aiming point, the instructor commands for example: 1. **RIGHT 100, 2. TRAIL DOWN.**

1. At the command **Right 100** No. 6 assisted by No. 7 moves the trail to the left until the trail spade graduation 100 is over that point on the ground which was under the zero graduation before the shift.



2. The instructor makes the appropriate change in the deflection setting and verifies the accuracy of the work of No. 6.

SECTION X.—COMBINED TRAINING AT THE PIECE AND AT THE CAISSON.

927. The duties of the gunner and Nos. 1, 6, and 7 are mutually dependent. So also are those of Nos. 2, 3, 4, and 5. Hence it is advisable at an early stage of instruction to train each of these combinations separately. The same practice may be used to advantage from time to time after the drill of the gun squad in the firing battery has been taken up.

CHAPTER III.—EXERCISES PRELIMINARY TO INSTRUCTION OF THE FIRING BATTERY.

SECTION II.—TO MOVE BY HAND THE CARRIAGES UNLIMBERED.

937. See paragraphs **191**, **192**, and **192½** (ante).

SECTION III.—PREPARATION FOR ACTION AND MARCH ORDER.

938. Does not apply.
939. Does not apply.
940. Does not apply.
941. Does not apply.
942. See paragraph **202** (ante).
943. Does not apply.

CHAPTER IV.—THE FIRING BATTERY AND THE DUTIES OF ITS GUN SQUADS.

SECTION I.—COMPOSITION, FORMATION, AND INSTRUCTION OF THE FIRING BATTERY.

945. For the instruction of recruits the drill of the gun squads is at first carried on in the park. Later the instruction of the firing battery is carried on over all forms of terrain available.

In the field it is desirable that the guns be placed approximately in line with regular intervals of approximately 20 yards between adjacent gun wheels. It is more important that the intervals be regular than that they be exactly 20 yards. Each chief of section cautions (Such) piece, or, No. (So-and-so), as soon as his carriages have been established in position (47).

In the park the limbered carriages are formed in line or column of double sections, the caisson of each section being alongside of and at two yards interval from its piece, at such intervals or distances between sections as may be practicable. By the execution of action front (rear, right, or left) the carriages are placed in line in the firing position at sufficient intervals for the drill of the gun squads.

SECTION III.—MEASURES FOR FACILITATING THE RAPID OPENING OF FIRE.

954. The targets for light field guns are most frequently at a site of about 300 and at ranges near 6,000 yards. Hence the setting of sights, quadrants, and fuze setters at Site 300, Corrector 30, Range 6000, in the absence of exact data, and the leveling of instruments tend to hasten the opening of fire. If indirect laying is to be used the aiming point is usually known as soon as the carriages are unlimbered.

Since the front of the battery is usually established about perpendicular to the direction in which fire is to be delivered, the head of the panoramic sight should be turned on the aiming point as soon as the gun, prepared for action, is fully established in its position.

It is frequently practicable to communicate most of the firing data and to set the instruments before occupying a position, or at least some time before the fire is to be opened.

If no target is visible or none has been assigned to the battery when the position is occupied, the captain selects a prominent point near the center of the sector he is to cover and causes the guns to be laid upon it.

SECTION VI.—PROJECTILES, FUZES, KINDS OF FIRE.

982. For convenience the fuze setter for setting the time fuze is graduated in range. But due to errors of the fuze and other causes the base charge will not always explode at exactly the range set off. Moreover, it is sometimes necessary to vary the height of burst. For this the fuze setter is arranged to permit changing the fuze setting without changing the range reading on the fuze setter. The device for accomplishing this is called **the corrector.** A corrector of about 40 ordinarily gives a height of burst of about 5 mils as seen from the guns. This height of burst is called **normal.** Raising the corrector **shortens** the part of the time train which must burn before the base charge is reached and therefore **raises** the height of burst. Lowering the corrector **lengthens** the time of burning and lowers the height of burst.

SECTION IX.—METHODS OF FIRE.

1007. The commands for sweeping are: **Battery (So many) rounds, sweeping,** or, **Right (Left), (So many) rounds, sweeping.** The execution is the same as that of volley fire (**1003–1005**) in every respect, except that after the first and each succeeding round of the sweep the gunner traverses the piece to the left by one full turn of the traversing handwheel, disregarding accurate laying in direction.

As soon as the last round of the sweep has been fired, the gunner traverses the piece back to the right until the line of

sight is again on the right of his portion of the target or on the aiming point.

SECTION XII.—COMBINED DUTIES OF THE MEMBERS OF THE GUN SQUADS.

1028. In indirect laying it is not necessary for the gunner to set the range exactly. During direct laying the exact setting of the sight for range is essential. Rapidity on the part of the gunner in traversing the piece to the center of its traverse when the trail is to be shifted in indirect laying facilitates the work of the chief of section. Similarly, for direct laying at moving targets the work of Nos. 6 and 7 is greatly facilitated if the gunner, when the trail must be shifted, rapidly traverses the gun as far as it will go in the direction opposed to that in which the target is moving. The gunner must not interfere with the elevating mechanism in indirect laying.

1029. No. 1 helps No. 2 by opening the breech before the gun has returned into battery and by seeing that the block remains fully away from the breech. No. 1 must not interfere with the elevating mechanism during direct laying.

1030. As soon as the battery goes into position and is prepared for action, No. 5 withdraws a round of shrapnel from the chest and passes it to No. 4, who places it on the ground and holds it while No. 3 sets the fuze. This operation is repeated as soon as the round has been passed to No. 2. Whatever the kind of fire, No. 5 always has, during firing, a round of ammunition ready to pass to No. 4. No. 2, in percussion fire, loads the piece immediately after the breech has been opened. To this end, as soon as he has taken a round of ammunition from No. 4, he stands at the breech ready to load as soon as it has been opened. He takes care that no part of his body shall be in

the way of the gun during recoil. In volley fire with time shrapnel, when more than one round is fired, No. 2, after the fuze has been set, stands ready, as in percussion fire, to load each round after the first.

1031. Whenever Nos. 6 and 7 require assistance in shifting the trail, the chief of section designates the cannoneers who are to assist and the places at which they are to work.

CHAPTER V.—REPLACEMENT OF AMMUNITION AND OF CASUALTIES.

1034. The ammunition in the caissons of the gun sections is ordinarily replenished from such ammunition as may be stored near the guns and from the caissons of the fifth section.

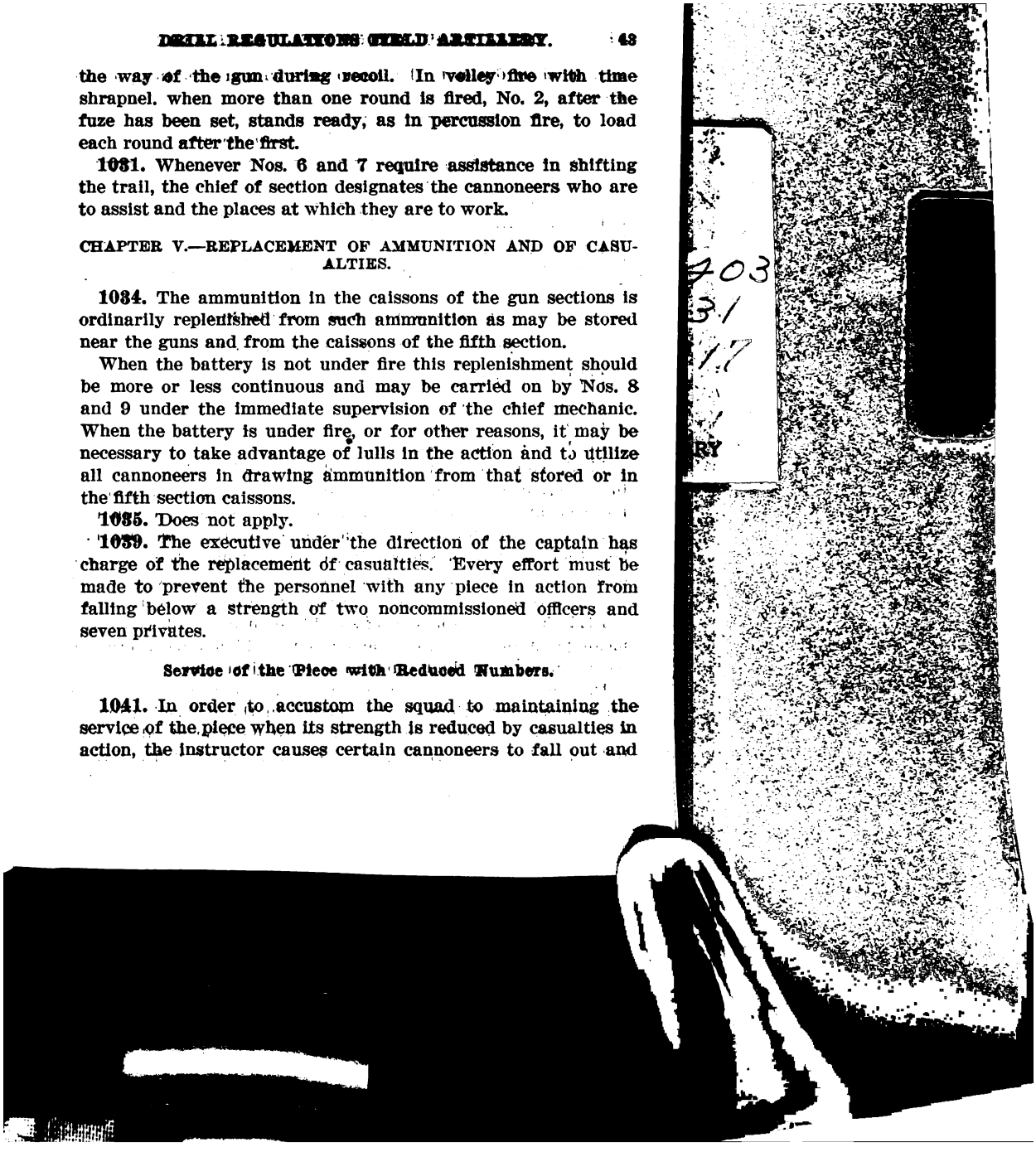
When the battery is not under fire this replenishment should be more or less continuous and may be carried on by Nos. 8 and 9 under the immediate supervision of the chief mechanic. When the battery is under fire, or for other reasons, it may be necessary to take advantage of lulls in the action and to utilize all cannoneers in drawing ammunition from that stored or in the fifth section caissons.

1035. Does not apply.

1039. The executive under the direction of the captain has charge of the replacement of casualties. Every effort must be made to prevent the personnel with any piece in action from falling below a strength of two noncommissioned officers and seven privates.

Service of the Piece with Reduced Numbers.

1041. In order to accustom the squad to maintaining the service of the piece when its strength is reduced by casualties in action, the instructor causes certain cannoneers to fall out and



assigns their duties to the cannoneers who are retained, as follows:

Cannoneers retained	Distribution of duties.						
	G	1	2	3	4	5	6
G, 1, 2, 3, 4, 5, 6	G	1	2,7	3	4	5	6
G, 1, 2, 3, 4, 5	G	1	2,7	3	4,6	5	.....
G, 1, 2, 3, 4	G	1	2,7	3	4,5,6	.....	.....
G, 1, 2, 3	G	1	2,4,7	3,5,6	.....	.....	.....

CHAPTER VI.—SERVICE FIRINGS.

SECTION VIII.—PREPARATION OF FIRE.

1171. Does not apply.

1172. Does not apply.

1173. Does not apply.

1174. Does not apply.

1183. To overcome the effects of wind and drift, a correction in deflection may be necessary. Its amount is generally small, however, and with a little experience may be readily estimated.

The correction for drift is always additive; that for wind may be either additive or subtractive, depending upon the direction of the wind. The value of each correction is first estimated; they are then combined to secure the resultant correction.

1217. The corrector setting should be such as will cause the mean point of burst to be about 5 mils high during fire for effect; about 1 mil high during fire for adjustment.

Due to variations in powders and fuze compositions and to atmospheric conditions, and to errors in the determination of the site, the most suitable corrector must be determined in each individual instance. Hence, at the commencement of fire, a trial

corrector must be taken. This trial corrector is such as is suggested by previous experience with the ammunition in use and with local atmospheric conditions.

Section IX.—Observation of Fire.

1245. When the shrapnel bursts, the smoke, white or light gray in appearance, is projected in the direction of the trajectory. The point of burst is therefore always above the center of the smoke ball. At ranges beyond about 3,000 yards the point of burst is near to or above the summit of the smoke ball, and the latter, observed from near the plane of fire, is seen in a pear-shaped form, small end uppermost.

1257. For convenience, bursts are classified as follows:

Graze: Bursts on impact.

Below: Air bursts below the target.

Graze below: Graze bursts below the target.

Low: Air bursts from zero to 3 mils above the bottom of the target.

Normal: Air bursts from 3 to 6 mils above the bottom of the target.

High: Air bursts from 6 to 8 mils above the bottom of the target.

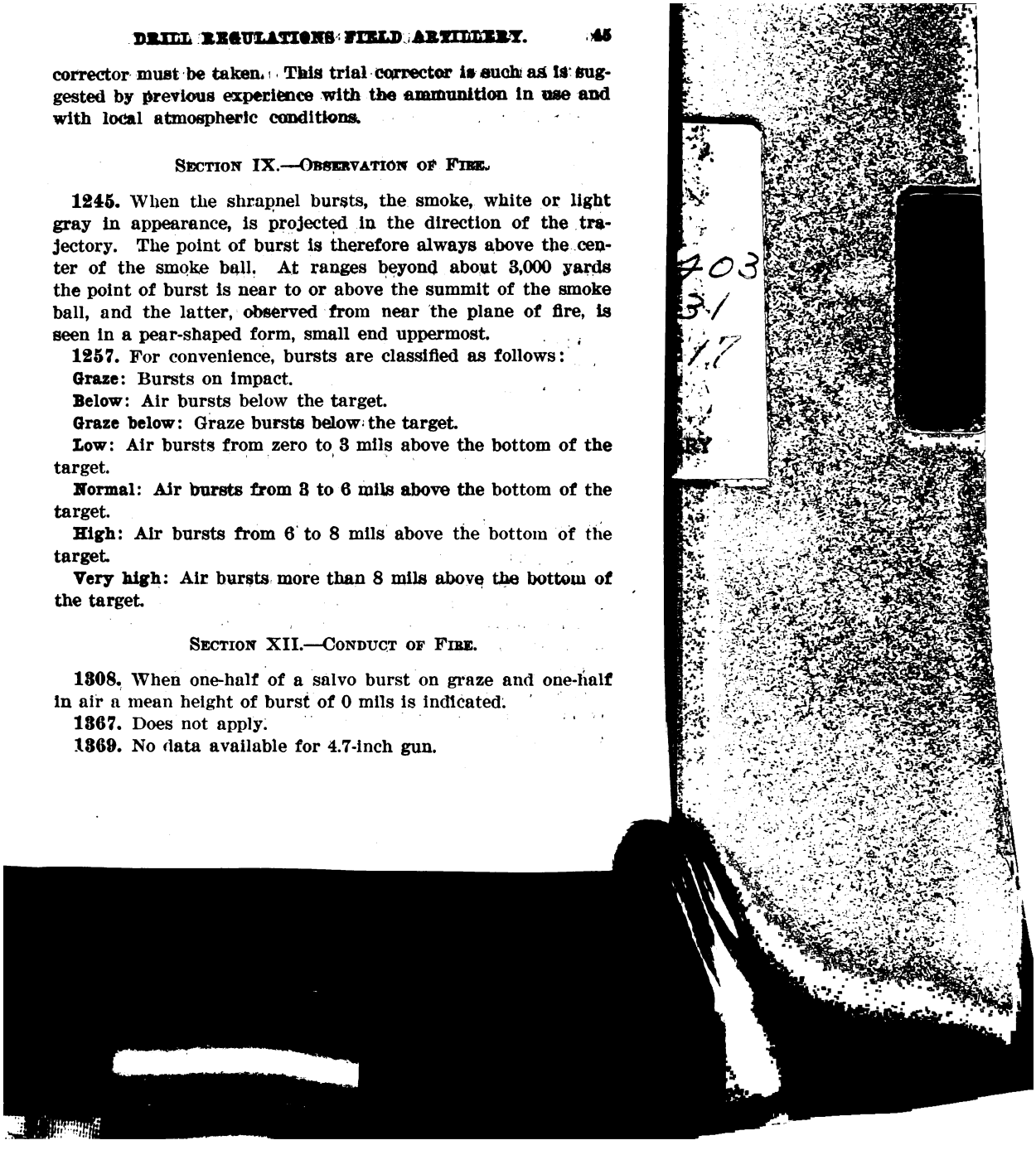
Very high: Air bursts more than 8 mils above the bottom of the target.

Section XII.—Conduct of Fire.

1308. When one-half of a salvo burst on graze and one-half in air a mean height of burst of 0 mils is indicated.

1367. Does not apply.

1369. No data available for 4.7-inch gun.



1377. In general applies. The front covered by 4.7-inch shrapnel is somewhat greater than that of 3-inch shrapnel.

1388. Fire at will is employed solely for the close defense of the guns.

Against a slowly moving enemy, such as Infantry, the fire should be commenced when he has arrived within about 500 yards of the gun; against a rapidly moving enemy, such as Cavalry, when he has arrived within about 1,000 yards; the purpose in both cases being surely to establish a fire-swept zone through which the enemy must pass in order to reach the guns.

SECTION XIV.—TARGETS.

1413. In general applies. No exact data available for 4.7-inch gun.

1415. Applies in general to 4.7-inch gun.

PART X.

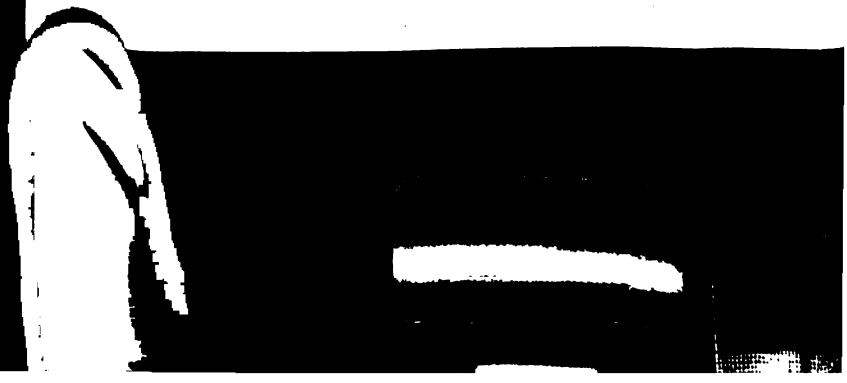
ARTILLERY IN THE FIELD.

CHAPTER IV.—CHOICE OF POSITION.

SECTION II.—LIMBERS, COMBAT TRAINS, AND AMMUNITION TRAIN.

1556. The position to be occupied and the formation to be taken by the teams depend upon the nature of the cover available. To secure the maximum protection and to have free and prompt access to the guns are the objects in view in the choice of position for the teams.

Concealment from view and protection from fire as well are secured by placing the teams behind vertical cover. When such cover is available, the teams are ordinarily placed in section or double section column parallel to the cover.



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Ridges having easy slopes afford concealment from view. They do not, however, afford protection from searching fire. The effect of searching fire in such cases may be avoided or greatly reduced in amount by placing the teams more than 400 yards in rear of the covering crest.

If the teams can not be echeloned with respect to the firing batteries, they should be at least 500 yards in rear of the guns.

When it is impracticable to conceal the teams from the view of the enemy, they should be posted as far from the guns as the conditions of the case warrant and formed in line, faced toward the enemy, with as wide intervals between teams as the ground will permit.

CHAPTER V.—DEFILADE AND COVER.

1564. Training may enable officers to make approximate solutions of the problem by the simple estimation (**1175**). Simple methods based on approximate measures may give still more accurate results.

Such methods are dependent upon the angles of elevation corresponding to the various ranges. For the 4.7-inch gun these angles may be quickly determined approximately as follows: For ranges up to 2,500 yards, the angle of departure is twice the number of hundreds of yards of range. This rule is useful in determining the drop of the projectile in reaching the mask. For ranges above 2,500 yards, the angle of departure is 50 less than four times the number of hundreds of yards of range. This rule gives close approximation at midranges and less than the correct values at all ranges, so that it is a safe rule for use in clearing the mask.

1565. When the position considered is on the reverse slope the possible positions in which the guns may be placed may be

determined as follows: The observer, mounted, places himself so that the target or terrain on which the target is expected is just visible over the covering crest. If the distance of the observer to the crest is 75 yards or over, the guns may be placed anywhere on the reverse slope so long as this slope remains approximately regular and yet be able to clear the crest at ranges of 2,000 yards and over.

This method rests on the assumption that the height of the eye of a man mounted is about 3 yards above the ground. Since the observer, mounted, is so placed that the line from his eye to the target is tangent to the crest, the slope, when he is 75 yards from the crest, is 1 on 25. A slope of 1 on 25 is equivalent to an angle of 40 mils, which corresponds to a range of 2,000 yards.

If the distance of a dismounted observer is 50 yards from the crest when the target is just visible above the mask, the guns may be placed somewhat down the slope from the observer and yet be available to fire at a range as short as 2,000 yards. The reasons for this are similar to those outlined in the preceding paragraph.

1566. Similar methods to those above described enable a reconnaissance officer to approximate the least range corresponding to a position on any reverse slope. The height, about 1 yard of the axis of the bore above the ground as well as the errors in the assumptions, tend toward certainty of the trajectory clearing the crest. When friendly troops occupy the covering crest or when the position of the guns is several hundred yards from the masks, allowance for safety may readily be made.

Thus, if the reverse slope is 1 on 20 and it is desired that the trajectory pass 10 mils above the covering crest, the guns may be placed practically anywhere on the slope and yet clear the crest at a least range of about 2,800 yards.

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1567. When mountains are visible in the direction of the targets or when certain cloud conditions exist with sufficient stability, it is sometimes possible to locate a point at a height above the target equal, or nearly so, to the elevation corresponding to the range. When this is possible the position of the guns giving the maximum defilade may readily be determined as follows: From the covering crest select the nearest target, or point, on which fire is to be delivered. With the hand lay off above the target the corresponding elevation and locate the resulting point. Moving down the reverse slope the guns can be placed anywhere so long as this auxiliary point is visible. For example, from the covering crest the observer locates the nearest target and estimates its range as 2,000 yards, for which the elevation is 40 mils. Laying off a vertical angle of 40 mils from the target he locates a certain natural feature. He then goes down the reverse slope until this feature is just visible above the covering crest. This position is that giving the maximum possible defilade. If the resulting position is several hundred yards away from the crest, allowance must be made for the drop of the trajectory from the line of departure. Ten mils, for example, may readily be allowed by determining the position from which the located point will appear at that angle above the covering crest.

1568. In rolling country practically any position on the counterslope may be occupied. In more broken country the following method may be of assistance: Locate the point on the counterslope from which the nearest target upon which fire is to be delivered is just visible above the covering crest. Estimate the range to the target and to the covering crest. Determine the elevation corresponding to the range from the covering crest

to the target. Consider each unit of the number of hundreds of yards to the crest as one-tenth and multiply the resulting decimal by the elevation just determined. Considering the product obtained as yards and going down the slope toward the covering crest, the guns may be placed in any position so long as their vertical distance in yards below the point on the counterslope from which the target could be seen is less than the product mentioned.

For example, standing at the point on the counterslope from which the nearest target is just visible above the covering crest the range to the target is estimated as 2,500 and the distance to the covering crest as 500. The difference, or the range from the covering crest to the target, is 2,000 and the elevation corresponding to 2,000 is 40 mils. Multiplying 0.5 by 40 we obtain 20. The guns may be placed 20 yards vertically below the observer.

This method makes ample provision for certainty in clearing the covering crest.

1576. Applies in general to 4.7-inch matériel. Dimensions given should be altered to accommodate 4.7-inch matériel.

CHAPTER X.—AMMUNITION SUPPLY.

1717. The ammunition on hand for 4.7-inch field guns, including that carried in the ammunition train, is 336 rounds per gun, distributed as follows:

	Rounds.
With the firing battery	77
With the combat trains	91
With the ammunition train	168
Total	336

CHAPTER XII.—TRANSPORTATION BY RAIL AND WATER.

SECTION I.—BY RAIL.

1733. The carriages are transported on flat or gondola cars or occasionally in automobile cars. Flat cars are more convenient to load and unload, especially when permanent facilities are not available.

The flat cars usually furnished vary in length from 34 to 44 feet, but cars longer than 42 feet are unusual. In loading a battery during service operations it is desirable to keep complete gun sections together. The ordnance carriages of a 4.7-inch gun battery on war footing may be thus loaded, when cars at least 38 feet long are available, in the following manner:

4 cars, each to contain—
- 1 gun and its limber.
- 2 caisson limbers.
- 2 caissons.

2 cars, each to contain—
- 2 caisson limbers.
- 2 caissons.
- 1 battery, or store wagon with its limber.

1733½. A convenient way to load is as follows: A caisson with trail toward middle of car, followed by other caissons similarly placed or by caisson limbers with poles elevated and resting on chest of carriage next loaded, and with gun and its limber at the end of the car, the gun in the firing position with its limber in front of it and reversed so as to bring the pole under the trail of the gun. All carriages should be so loaded that their tires bear squarely against the tires of adjacent carriages on the car.

On account of tunnels and overhead crossings great care must be taken that the ends of the elevated limber poles do not ex-

tend higher than the roof of the highest car of the train. As an additional precaution the elevated poles should be so secured as to prevent vertical rotation upward.

1749. When the command is on war footing, the cars required for the regimental headquarters, the headquarters company, the supply company, and one battalion headquarters are as follows:

Flat cars	9
Box cars for stores, harness, etc	2
Box car for forage	1
Stock cars	11
Baggage car, or box car with end doors	1
Tourist kitchen car	1
Sleeping cars	3
Total cars	28

1750. The cars required to move a 4.7-inch gun battery on a peace footing are, in the sequence in which the train is arranged, as follows:

Flat cars, at least 38 feet long	5
Box car for ammunition	1
Box car for stores, harness, etc	1
Box car for forage	1
Stock cars	7
Baggage car, or box car with end doors	1
Tourist kitchen car	1
Sleeping cars	3
Total cars	20

If no boxed ammunition is to be transported, the number of box cars may be reduced by one. If no stores other than those

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which are carried on the march are to accompany the battery, the number of box cars may be further reduced. The number of stock cars is sufficient to provide a separate car for privately owned mounts. The number of sleeping cars required will vary from time to time according to the number of men and animals authorized by law.

If tourist kitchen cars are not obtainable, the number of baggage cars and of sleepers must each be increased by one.

When the extra caissons for a war footing are to be taken, six flat cars are necessary, unless exceptionally long cars are available.

1751. When the 4.7-inch gun battery is on a war footing the cars required are:

Flat cars	6
Box car for ammunition	1
Box car for stores, harness, etc	1
Box car for forage	1
Stock cars	10
Baggage car, or box car with end doors	1
Tourist kitchen car	1
Sleeping cars	5
Total cars	26

The same remarks as to reductions and increases of cars apply as in the case of the battery on a peace footing, except that five tourist sleepers are sufficient to accommodate the personnel with but little crowding.

1771. The vehicles are secured with 4 by 4 inch timbers as follows:

Pieces nailed to the floor of the car on both sides of each wheel prevent transverse motion. These should be as long as practicable.

Pieces in front and rear of each wheel prevent longitudinal motion. These should be 7 feet long and are placed on and nailed to the pieces which lie alongside the wheels.

Pieces placed over the lowest part of the felloes and secured to the timbers which lie alongside the wheels prevent vertical motion. These should be 7 feet long. Small blocks nailed to the side timbers fore and aft of these crosspieces assist in securing them; 7-inch spikes should be used for this purpose.

Spare timbers should be secured to each car so that material for repairs may be available en route.

Two 2 by 4 timbers one nailed on top of the other may well in all cases be used instead of a single 4 by 4.

1772. The necessary timber and nails are furnished by the quartermaster. The most economical length of timber is 14 or 16 feet.

Whenever possible the proper lengths for crosspieces, blocks, etc., should be cut before the time for loading.

The material necessary for each battery is as follows:

One thousand eight hundred linear feet of 4 by 4 inch timber, or 3,600 linear feet of 2 by 4 inch timber.

One hundred and fifty pounds 20-penny (4-inch) nails.

Twenty pounds 7-inch nails.

For each three field wagons or reel cars 250 feet of timber and 10 pounds of nails should be allowed.

APPENDIX A.

TRACTOR-DRAWN BATTERIES.

1. So far as has yet been determined it seems best in 4.7-inch gun batteries furnished with tractors that no animals be present with the organization. Five tractors will be furnished to pull the firing battery, while the combat train will consist of trucks in numbers that will vary according to their capacity. Just what method will be adopted for the transportation of the special details has not yet been decided. The officers will probably be transported in one or more automobiles.

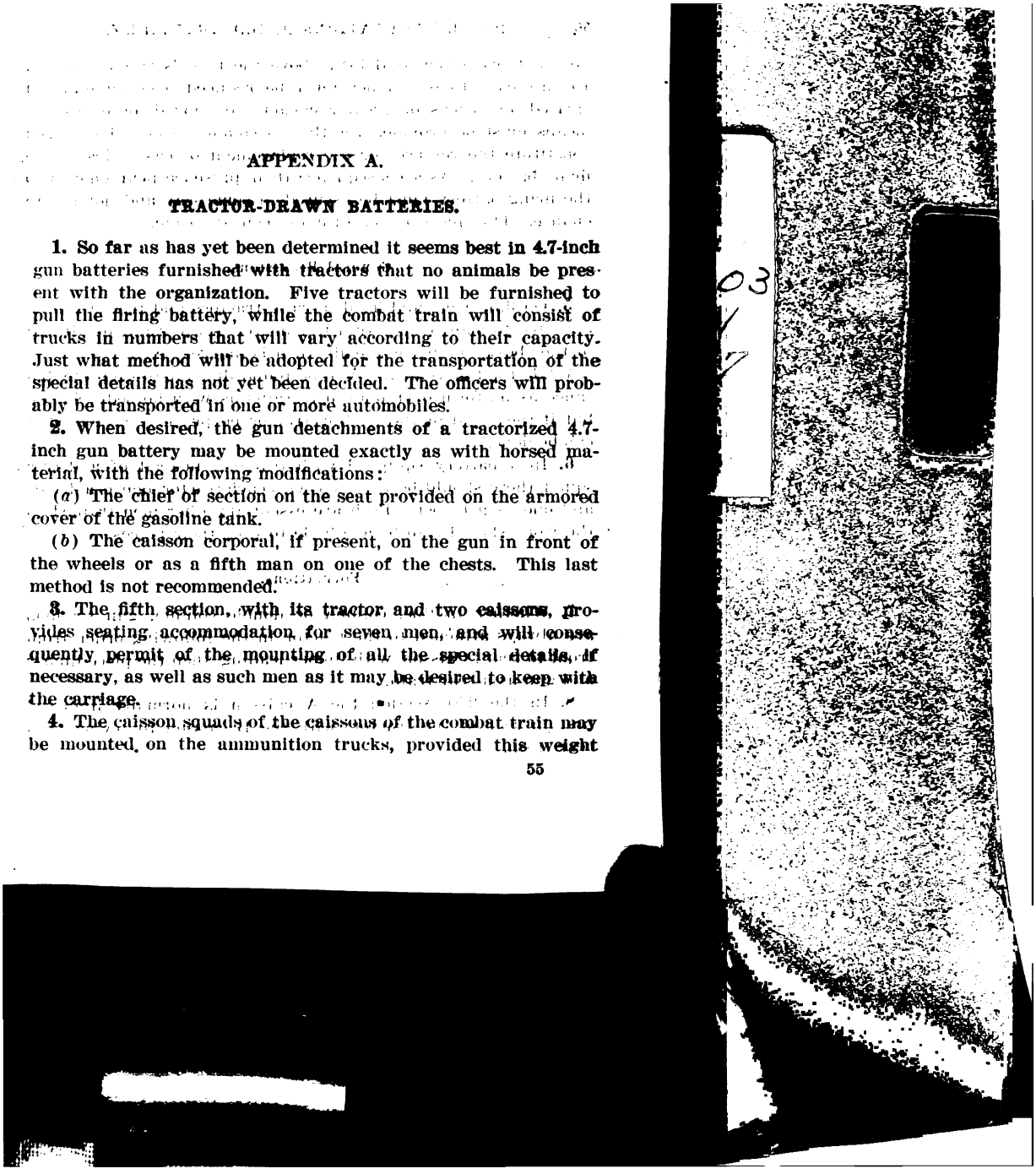
2. When desired, the gun detachments of a tractorized 4.7-inch gun battery may be mounted exactly as with horsed material, with the following modifications:

(*a*) The chief of section on the seat provided on the armored cover of the gasoline tank.

(*b*) The caisson corporal, if present, on the gun in front of the wheels or as a fifth man on one of the chests. This last method is not recommended.

3. The fifth section, with its tractor, and two caissons, provides seating accommodation for seven men, and will consequently permit of the mounting of all the special details, if necessary, as well as such men as it may be desired to keep with the carriage.

4. The caisson squads of the caissons of the combat train may be mounted on the ammunition trucks, provided this weight



does not bring the total load above the truck's rated capacity. In this case their number must be reduced, less ammunition carried, or trucks of greater capacity employed, or else other means must be provided for their accommodation. These men constitute the reserve for the replacement of casualties in the firing battery. As a consequence their presence near enough to the firing battery must be assured in some way and not left to chance. This question is still under consideration.

General Provisions.

5. On flat, even, and hard terrain, tractors and trucks can be expected to maneuver with a fair degree of accuracy, but if any of the above conditions are absent it is impossible.

While road marching, it will be found difficult to keep the distance as uniform over uneven terrains as with horsed vehicles, but if the speed of the leading tractor be properly regulated it can be done.

6. In a battery equipped with tractors, instead of a driver squad, there should be two men with each tractor, one as a driver and one as a helper. Both are essential; other men trained to the work should also be available to take their places.

Formations.

7. Whether in line, column or double column, gun sections are always attached to the tractor in the following order from front to rear: Caisson, with limber leading, then the piece limber and gun as a rear train.

8. In the fifth section the A caisson is normally limbered first in rear of the tractor, with the B caisson following as a rear train.

9. In the "order in line" there can be no second or rear rank of carriages, except in the combat train, as one tractor pulls all the carriages of a section.

10. The "section column" becomes a "platoon column," as complete sections must come abreast of each other.

11. The "flank column" becomes simply a platoon column at a more extended interval.

12. Platoon column or flank column are extended by complete sections instead of by the individual carriages of a section.

13. For drill purposes the abouts are made on the same radius as in horse vehicles.

14. There is no distinction between the "about" and the "countermarch" of a section.

15. The fifth section can not be subdivided for action until the position is occupied.

Distances and Intervals.

16. In line: Normal interval=length of section+8 yards.

In section column: Distance=8 yards.

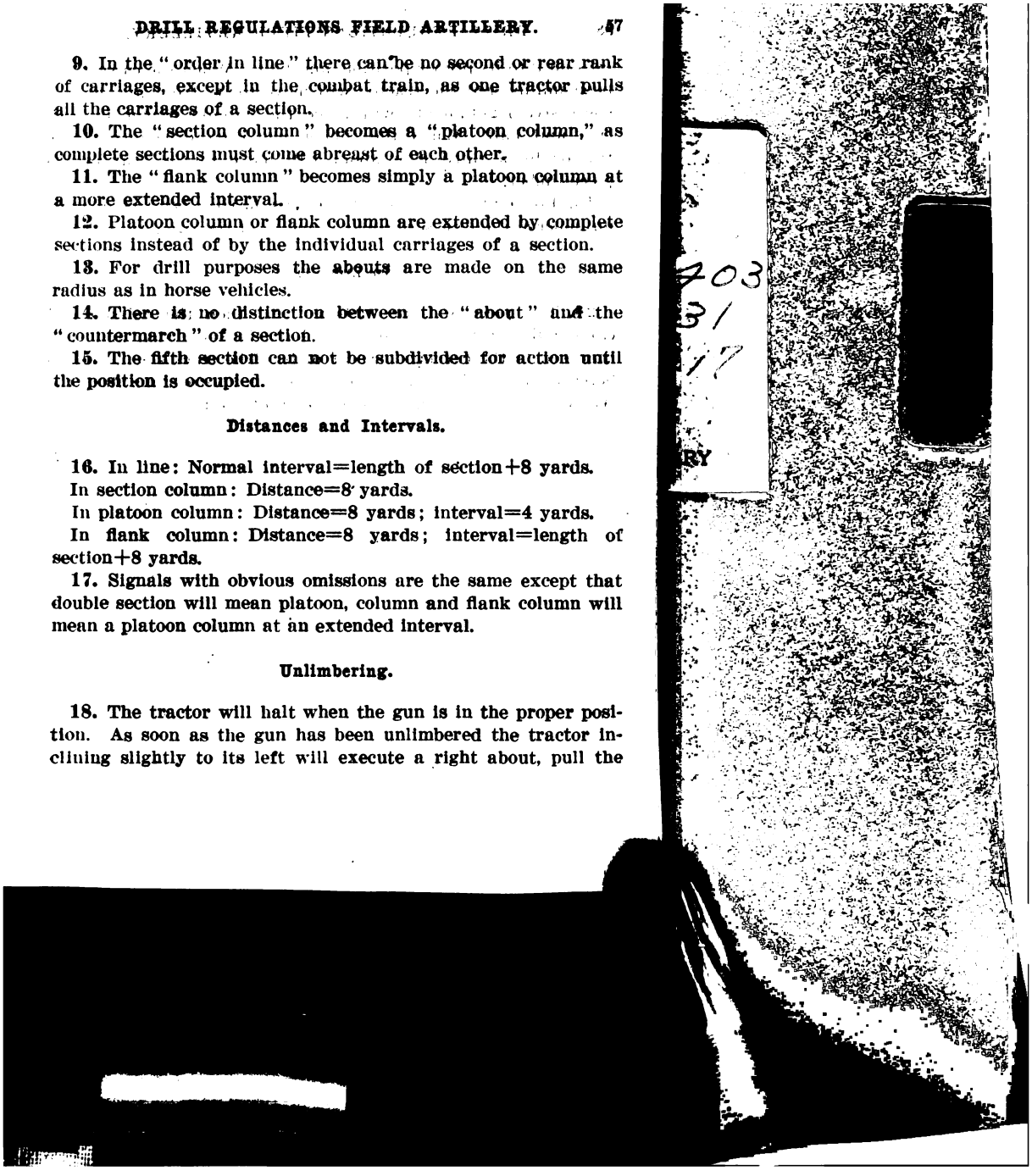
In platoon column: Distance=8 yards; interval=4 yards.

In flank column: Distance=8 yards; interval=length of section+8 yards.

17. Signals with obvious omissions are the same except that double section will mean platoon, column and flank column will mean a platoon column at an extended interval.

Unlimbering.

18. The tractor will halt when the gun is in the proper position. As soon as the gun has been unlimbered the tractor inclining slightly to its left will execute a right about, pull the

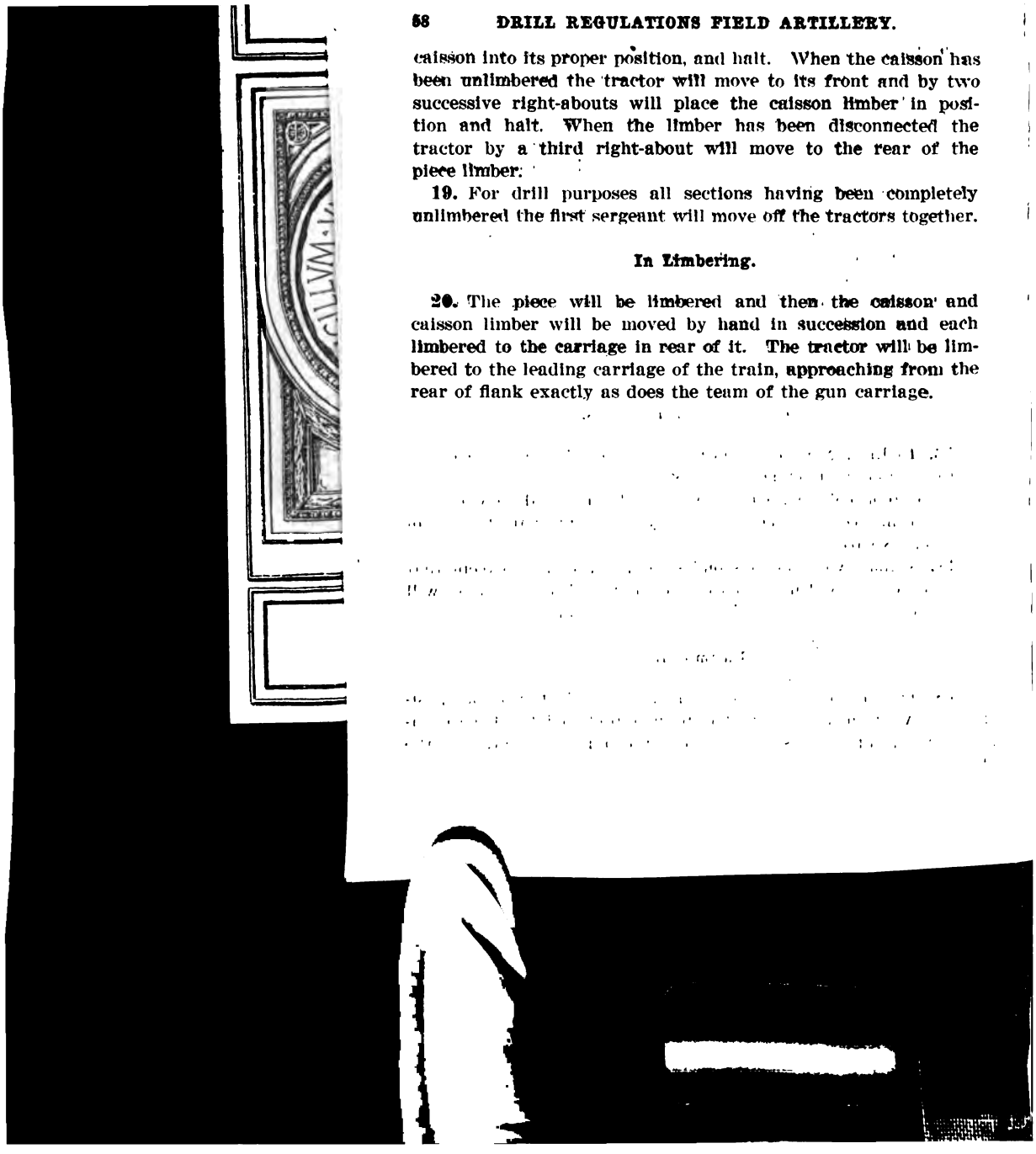


caisson into its proper position, and halt. When the caisson has been unlimbered the tractor will move to its front and by two successive right-abouts will place the caisson limber in position and halt. When the limber has been disconnected the tractor by a third right-about will move to the rear of the piece limber.

19. For drill purposes all sections having been completely unlimbered the first sergeant will move off the tractors together.

In Limbering.

20. The piece will be limbered and then the caisson and caisson limber will be moved by hand in succession and each limbered to the carriage in rear of it. The tractor will be limbered to the leading carriage of the train, approaching from the rear of flank exactly as does the team of the gun carriage.



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APPENDIX B.

1. The International Morse Code will be used for all Field Artillery communication, except by semaphore.

2. The following abbreviations are prescribed and will be memorized for communication by any method with the exceptions noted:

- - - - - - - - - Error. (All methods but ardois and semaphore.)
A---------Error. (Ardois and semaphore only.)
A D--------Additional.
A K T------Draw ammunition from combat train.
A L--------Draw ammunition from limbers.
A M--------Ammunition going forward.
A M C------At my command.
A P--------Aiming point.
B (numerals)----Battery (so many) rounds.
B S (numerals)----(Such) Battalion station.
B L--------Battery from the left.
B R--------Battery from the right.
C C C------Charge (mandatory at all times). Am about to charge if not instructed to contrary.
C F--------Cease firing.
C S--------Close station.
C T--------Change target.
D----------Down.
D F--------Deflection.
D T--------Double time. Rush. Hurry.

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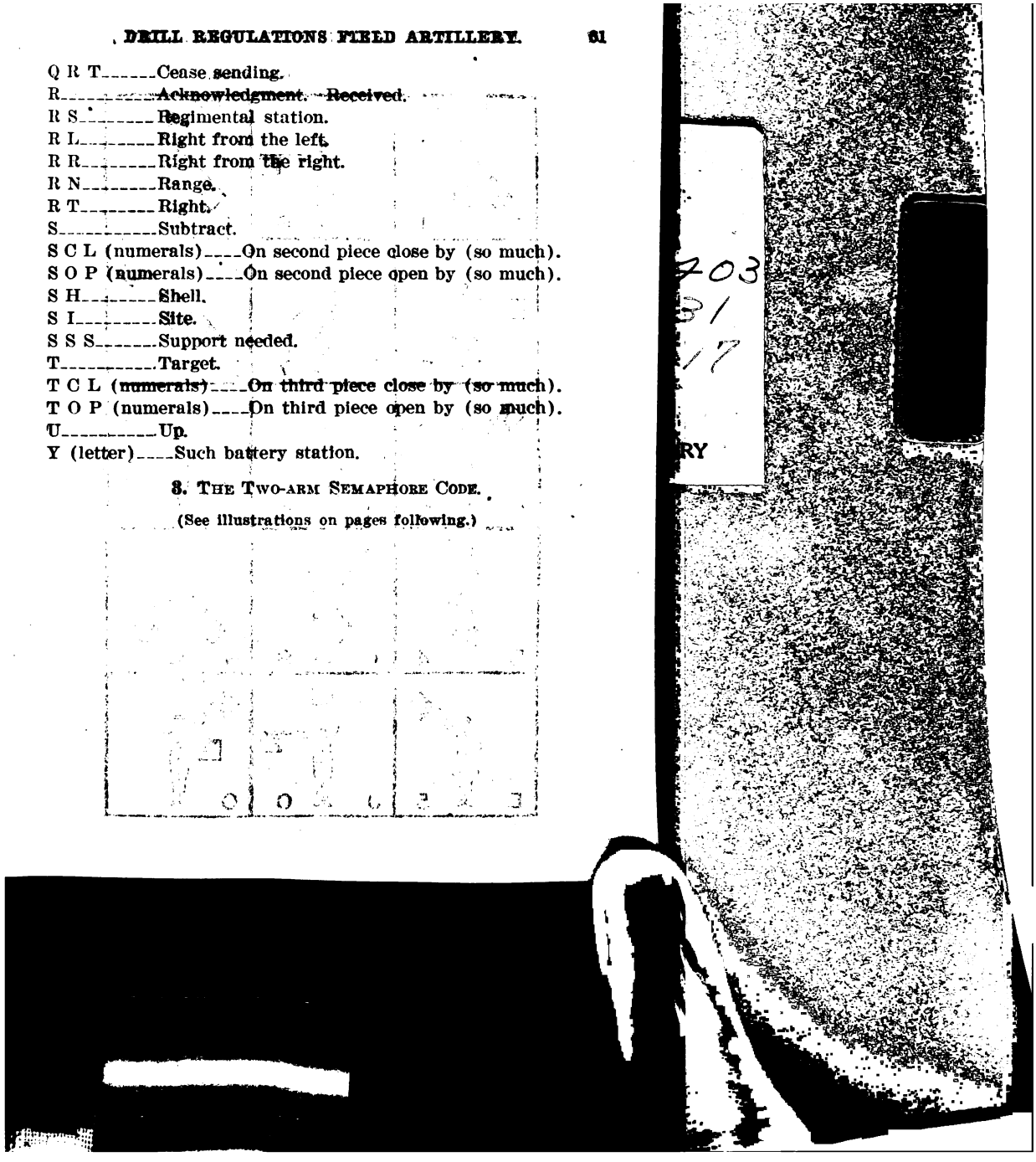
RARY

F_____Commence firing.
F C L (numerals)____On first piece close by (so much).
F L_____Artillery fire is causing us losses.
F O P (numerals)____On first piece open by (so much).
G_____Move forward. Preparing to move forward.
H H H_____Halt. Action suspended.
I X_____Execute. Go ahead. Transmit.
J I_____Report firing date.
K_____Negative. No.
K R_____Corrector.
L_____Preparatory. Attention.
L C L (numerals)____On fourth piece close by (so much).
L O P (numerals)____On fourth piece open by (so much).
L T_____Left.
L L_____Left from the left.
L R_____Left from the right.
L E (numerals)____Less (so much).
M D_____Move down.
M L_____Move to your left.
M R_____Move to your right.
M U_____Move up.
M O (numerals)____More (so much).
N_____Annul. Cancel.
O_____What is the (R. N., etc.)? Interrogatory. (Ardois and semaphore only.)
- - — — - - What is the (R. N., etc.)? Interrogatory. (All methods but ardois and semaphore.)
P_____Affirmative. Yes.
P S_____Percussion. Shrapnel.
Q R Q_____Send faster.
Q R S_____Send slower.

Q R T_____Cease sending.
R_____Acknowledgment. Received.
R S_____Regimental station.
R L_____Right from the left.
R R_____Right from the right.
R N_____Range.
R T_____Right.
S_____Subtract.
S C L (numerals)____On second piece close by (so much).
S O P (numerals)____On second piece open by (so much).
S H_____Shell.
S I_____Site.
S S S_____Support needed.
T_____Target.
T C L (numerals)____On third piece close by (so much).
T O P (numerals)____On third piece open by (so much).
U_____Up.
Y (letter)____Such battery station.

8. The Two-arm Semaphore Code.

(See illustrations on pages following.)



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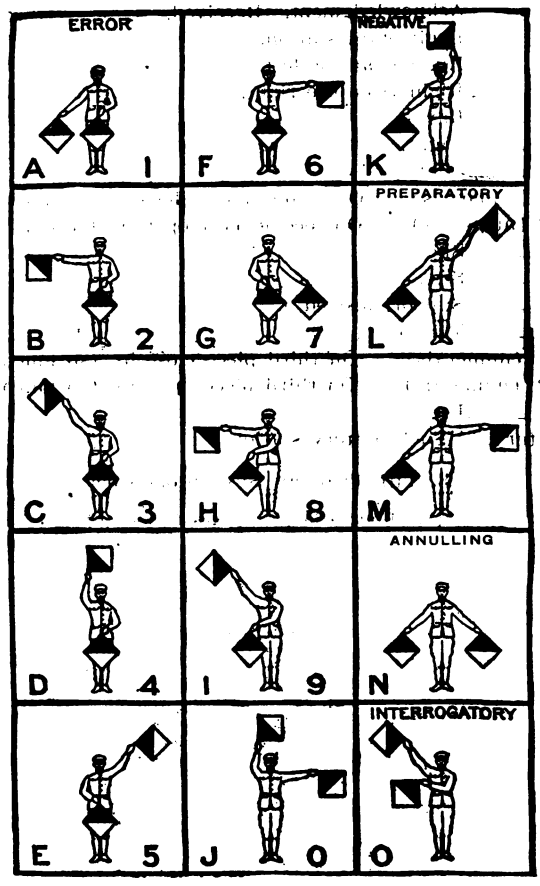

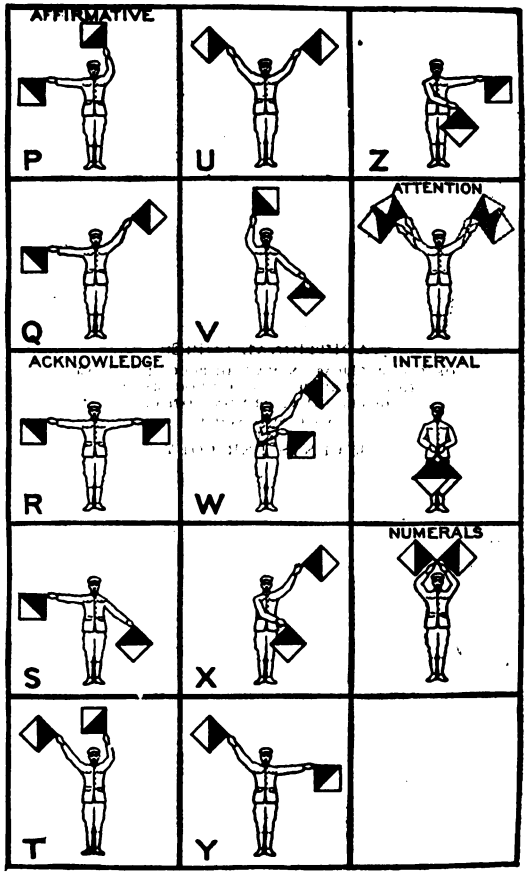
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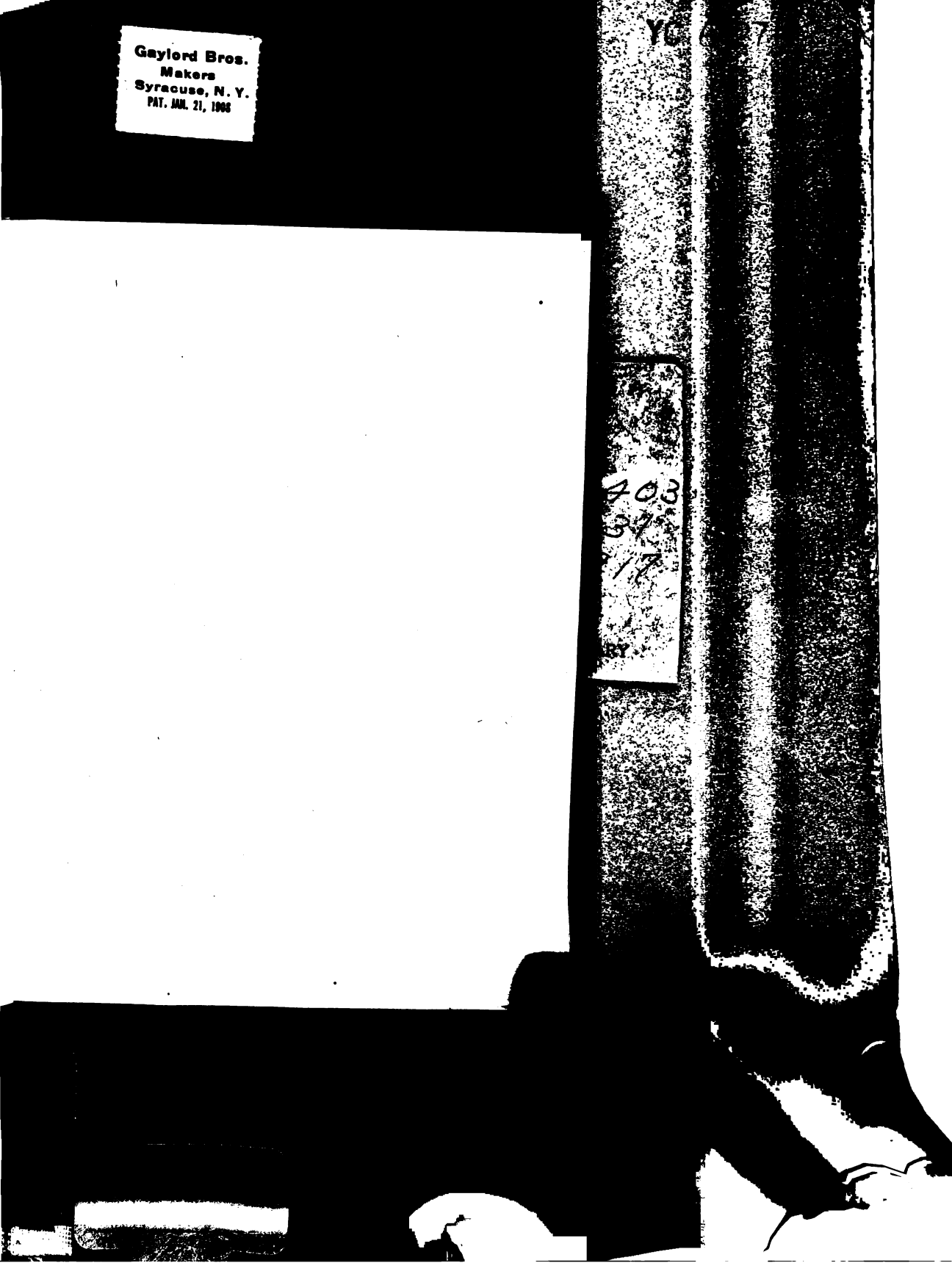
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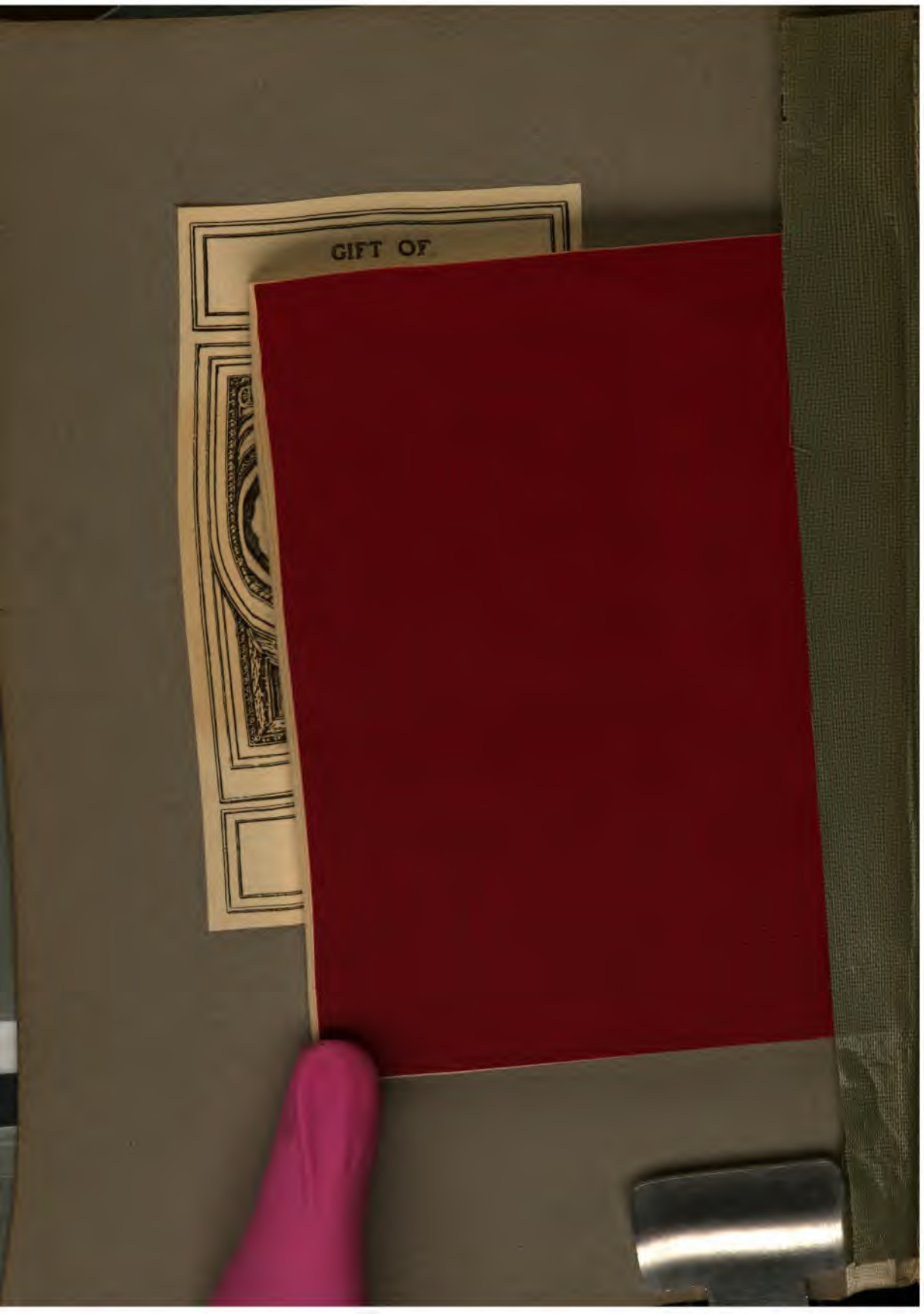
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